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REMEDIAL PROJECT MANAGERS' MEETING

NASA/JET PROPULSION LABORATORY

15 October 1998

ATTENDEES:

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Charles L. Buril, JPL
Alex Carlos, RWQCB-LA
Mark Cutler, Foster Wheeler
Richard Gebert, DTSC
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Reported by: Louise K. Mizota, CSR 2818

Pasadena, California

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10:19 A.M.

BURIL: Let's go ahead and start with the first item on the agenda. I'll go ahead and talk a little bit about the perchlorate treatment plant and how things are going with that.

Things are going as close to flawless as you could possibly imagine. The plant has been in operation now for just about a month. We've been sampling it on a regular basis, and thus far the ion exchange portion of the plant has been perfect. It has not had any problem in terms of removal of perchlorate.

We are doing some unusual things with the plant only because the perchlorate concentrations and volatile concentrations coming out of Well 7 have fallen rather dramatically. Carbon tetrachloride concentrations are running in the 20s and 30s as opposed to several hundred as we used to see. Perchlorate ion concentrations around 100 as opposed to the 600 that we initially thought we might see.

ATWATER: You say about 100?

BURIL: Yes. Around 100 to 130, varying in that range.

ATWATER: That's what you said last month in that conference call.

BURIL: Right. Yes. It hasn't gone up and it hasn't gone down.

TCE concentrations, if we were to base our remedial decisions on that, we'd be done. It's under 5. We are doing some sampling of the wells immediately around the area to try and understand a little bit better what's happening.

There's Peter. We just started just this second, Pete.

We're sampling some of the standpipe and the upper screens of, what -- one multi-port well, Mark?

CUTLER: Two.

BURIL: Two. To try and see if there's been any alteration of the contaminant distribution that we might be able to figure out.

We're a little confused as to where the heck all this stuff went and we're trying to figure out just what is going on there.

As far as the plant goes, we are trying to get data that deals with a number of concentration

levels. I think I mentioned earlier that we are spiking the influent stream with perchlorate. We are finishing up a level of 200 parts per billion right now, and we're looking at going up to 1200 parts per billion starting next week.

We're going to be bringing on a catalytic destruction system in about a month, and we'll be testing that for about a month. Now, that catalytic system is for brine regeneration or recycling. And we're hopeful that that will be very successful. All the tests in the lab that Calgon has conducted thus far have been very, very helpful and very successful. We're running right now at about four gallons a minute, and we have a waste generation rate of about 1 percent on an average. So overall, it's only producing a few mils of waste.

The site is available to tour later today if folks want to do that. Richard was here earlier with his toxicologist, had a site tour earlier this week and took a moment and went through the plant. We can do that at the end of the meeting, if you'd like, or somewhere along the way. I think you'd be suitably impressed with what you see up there.

As far as other things that are happening in terms of perchlorate, I'm not sure that all of

you know that one of the water companies that's associated with San Gabriel Valley Water Quality Authority has already decided to go ahead and implement a full-scale ISEP system. I believe the name of the place is La Puente County. It's out in the Baldwin Park area.

They've just authorized just around $4 million to install this plant. And it's a 2500 gallon a minute plant with a volatiles removal system, I'm not sure whether it's air stripping or carbon or what it is, an ISEP system for perchlorate, and an oxidation technology, I believe it's UV, for removal of NDMA, which they also have there and fortunately we don't. They are looking at beginning construction I believe the end of this calendar year.

RIPPERDA: What are they going to do with their perchlorate effluent?

BURIL: I believe that they're actually going to be trucking that away initially and disposing of it I think in a brine line. The desired plan, as I understand it, is that they want to get the same catalytic regeneration system out there at some point and try to regenerate the brine to be able to cycle it. Ultimately, if they do that, they should

get down into the very small percentage of waste generation. That's their ultimate goal, I think.

They are hopeful that the Department of Health will allow them to do this. They're either going to provide it directly to their customers or spread it in a spreading area that they have out there, depending upon what that ramification is with the DHS. No one really knows yet. DHS is aware that this is coming up and, as far as I know, they're working directly with them.

ATWATER: What did you say the flow rate was?

BURIL: I'm sorry. What?

ATWATER: What did you say the flow rate was?

BURIL: I understand it's 2500 gallon a minute maximum capacity.

CARLOS: This is the big Dalton well area? Or is it different?

BURIL: No. It's a different site. My understanding, it's one of the water companies that's had their wells completely shut down because of the perchlorate NDMA issue. They have to buy all their water. They don't have one well that they can turn to. They want to get some of their production --

ATWATER: Yeah. I think they already had air

strippers to do with the --

BURIL: I think you're right.

ATWATER: -- VOCs and the perchlorate last summer just shut them down. That's why they want to move quickly. And they also don't have a Met connection, so they're kind of stuck there.

BURIL: Oh, they don't have a Met connection. I wasn't aware of that. Okay.

So that's what's happening currently in the world of perchlorate.

We're hopeful that something does work well both in our pilot and in the full-scale. As I said, our pilot is actually working very well. And we're watching with great interest what's happening out there. Is it La Puente County? Is that what they call themselves?

ATWATER: I think it's La Puente County Water District.

BURIL: Any questions with that in mind, as far as perchlorate treatment plant and what's happening there? Okay.

ATWATER: Is that going to be -- is that manufactured by Calgon?

BURIL: Calgon is the principal organization.

ATWATER: There's no competition, is there? Is

there anybody else you know that's --

BURIL: Well, there's lots of people who do make ion exchange plants, but the ISEP system itself is a patented technology. You can just about find anyone to go out and build you a fixed bed ion bed.

ATWATER: Sure.

BURIL: But the rotating Calgon system is uniquely theirs. They've got the flow head at the top to direct the water, they've got that patented. So they're the only act in town for that particular approach.

ATWATER: None of the other vendors are trying to push treatment of perchlorate, as far as I know.

BURIL: I have a call from one gentleman who has a, I guess you'd say, a plan for biologic treatment of brine to remove perchlorate so that you can then recycle it. He's been in contact with -- we met with him once before. He's Clay McDonald. And we've kind of held him back a little bit only because we anticipate that either the concentrator system which Calgon talked about -- did I describe that to you folks, the perchlorate concentrator system for the brine recycler?

GEBERT: No.

BURIL: Let me tell you about that. This is

something that's still on the table in terms of design. They aren't sure they can make this work, but what they'd like to be able to do is to take the brine and run it through a special series of resins. And the resins, basically, are very, very strongly drawn to perchlorate, or vice versa. And basically it locks the perchlorate into the resin. They have reportedly an extremely high capacity for perchlorate absorption on the resin. And because of that, they feel they could get quite a bit of life out of it when you're talking about moderate concentrations that you might find in a brine solution.

Ultimately they would not even try to regenerate the brine or, excuse me, the resin which the brine goes through because it has such a strong affinity that it just doesn't work very well. You can't get it back off again. But the amount of resin that you would actually have to dispose of, which contains the perchlorate from the brine, would be very small because it does have a fairly good life.

They haven't really found a good resin to do that with yet. And I don't know all the details, but apparently they've run into more than one

technical problem with that approach. We were supposed to be testing that right now, but it didn't work out. We're actually storing all our brine and then trucking it off.

So that resin concentrating system is one that's still out there, and we're not sure when we're going to get that up. Okay.

Did I answer your question?

CARLOS: Uh-huh.

BURIL: All right. Any other questions or comments on the perchlorate treatment? Okay. Great.

Conceptual remedial actions. We've been scratching our heads after we generated the RI here, and we want to take a few minutes and share with you some of the things that we're thinking about.

Recognize that when I talk about things here, that there are actually other potentials that we've thought about but we've more or less dismissed them. I'll give you an example. Slurry walls for containment. A 1,000-foot slurry wall doesn't make a whole lot of sense. In situ vitrification doesn't make a whole lot of sense. Chemical fixing doesn't make a whole lot of sense. Any kind of a physical barrier installation, given the depth of our aquifer

here, doesn't make a whole lot of sense.

Those kinds of ideas have already been passed over, if you will. They will be presented in the FS as part of the review and so forth, but we aren't talking about those in terms of a real potential solution to any of the problems that we might face.

Things that we are looking at include a lot of pump and treat options, and they're kind of varied because of the involvement of the Pasadena and Lincoln Avenue wells being right here next to the Arroyo, potential desire to have a hot spot removal, things of that nature. The kinds of things we're looking at, first of all, we are going to look at a very solid no further action alternative. By "no further action" what we're identifying here is that we basically continue treating the Pasadena wells for VOCs as long as we're able to pump, but we wouldn't have perchlorate treatment. And basically blending would be the approach that the water purveyors would be having to utilize to meet their perchlorate standards. We would continue monitoring and just go on for as long as we can with that kind of alternative.

The next several that we have are really

kind of variations on the theme of pump and treat, and they vary in terms of where you pump and where you treat. The first one that's most obvious to us is wellhead treatment, "wellhead treatment" meaning that we would in some manner provide sufficient treatment for the water purveyors to utilize their wells in any way that they'd like.

Now, the reason that that appears to be a good alternative is given what you have there in the RI report, and that is that the Pasadena wells have apparently both created a problem in terms of allowing contamination to be drawn down deeper and then pulled through the deeper layers, and in the same breath they prevented further migration. And in fact, their operations as they currently maintain them are stopping the migration from going further east. And so we would basically want to tie into that in some fashion.

This presupposes that there is a successful perchlorate treatment. Ion exchange is kind of the one that appears to be the one of choice right now, if that works out.

And we wouldn't deal with hot spot removal in this particular situation. We'd simply allow those wells to act as the containment and ultimate

remedial action for not only the site here but also for anything that goes off the site. Basically, just capturing it as it goes downstream.

ATWATER: What level of water quality are you going to treat to?

BURIL: That's an excellent question, Richard. I think that's a wonderful segue to the discussion of ARARs.

What is the water quality criteria that we would have to treat to? I'm looking right at the agency saying "Tell me the answer."

ROBLES: And put it in writing.

BURIL: Because that is a design parameter that is going to be very important to us, obviously. Do you have a feel for it now?

RIPPERDA: ARARs are MCLs. That's an easy one. Whether or not you have to treat to that in the aquifer is a question. The MCLs are the ARAR. Whether or not you have to treat in the aquifer to meet those is open to discussion.

BURIL: Now, when you say "treat the aquifer," do you mean get the aquifer down to that level in the ground? Is that what you mean?

RIPPERDA: Yes.

BURIL: Okay. Yes. That I would agree to.

Now, how do we deal with the issue of perchlorate, because there is no, quote, MCL associated with that.

ROBLES: What aquifer? The whole aquifer?

BURIL: Yes. See, there's another question that Pete has.

Is the interim action level that DHS put out, is that suitable to be using as an ARAR and that being our -- if that is the ARAR, is that the criteria that we need to meet for pumping water and then discharging?

GEBERT: I would say yes until there is another number that is agreed upon. For purposes right now, I would say yes.

ATWATER: Let me just say that at the Raymond Basin Management Board they talked about it preliminarily. Certainly there needs to be some consultation with DHS and whether or not on a pump and treat they would approve a purveyor taking perchlorate in a treated system like this. Their general sense is, particularly given the performance of the ion exchange, is that we ought to shoot for the 4 to 5 nondetect range.

One of the reasons also, if you take the new consumer notice requirements of EPA under the

Safe Drinking Water Act, if they have levels of above 50 percent of the 18, it would be generally interpreted, and that's something we have to check with DHS and the EPA drinking water people, but the purveyor would have to do public notification in the consumer report. And every April they'd have to say -- and given the obvious sensitivity of that, I know the purveyors would be put in an uncomfortable situation and they would probably prefer, particularly if the technology works out, I think they would much prefer to have it be at the nondetect level and have that cushion of conservatism in there.

And realizing right now they are blending out, but Lincoln wells are running 7 --

BURIL: Low 10s.

ATWATER: Yeah. They're 7 to 10 or something like that. Pasadena's blended water in their system, I don't have a feel for it right off the top of my head, but it's probably below.

BURIL: It's below, from what Brad said yesterday.

ATWATER: Exactly. I don't know if they talked about it any more yesterday, but that's kind of the -- in the last month we've been chatting about

it.

But clearly, I would suggest that we'd want to have some consultation with DHS on that because they would have to approve the pump and treat going into a domestic system.

BURIL: Going to a domestic system.

ROBLES: Let me throw a monkey wrench into this. Given the fact that MWD caused the background levels, is it fair for us to clean to nondetect?

BURIL: Now, there's two questions there.

ATWATER: That's an interesting statement. You're making an accusation based --

ROBLES: No. No. It's just Colorado River water.

ATWATER: You haven't watched it. This summer it has been at nondetect.

ROBLES: It has been at nondetect.

ATWATER: Every week we measure it. Ron sent over that data to you. But it's -- I don't know what it was a year and a half ago, but for the last year --

BURIL: No one does.

ATWATER: And so that's why I'm a little bit surprised by your statement.

BURIL: I think the point here is when Peter

asks what aquifer, I think that there's a real dividing line in terms of what we think the JPL responsibility is versus what's in the overall aquifer. The responsibility that we view as something which JPL might have concern with is limited to the areas that are described in the RI. There's perchlorate all the way down through the Raymond Basin and out into the main San Gabriel Basin. There's no, quote-unquote, obvious answers as to who that belongs to.

ATWATER: In the sampling we've done, you're right. But most of that was below the DHS, EPA detection level of 4 to 5. So when you say you see background levels, it's true there are hits. But if you define the injection level at 4 to 5, then most of that background is defined as zero.

BURIL: But yet we still see some of those, if I remember the Stetson map from last time or maybe just the time before last, you do see hits that are at 10 and 11, 8 and 9.

ATWATER: No. Let's go back and look at the data, but I don't think that's true at all. It's all in -- the 4 to 5 is the high range.

BURIL: We could double check that.

ATWATER: And if you look at the Colorado River

water and the deliveries to Foothill and Pasadena for the last year, most of that, there's a few 7s and 8s. And I don't know what the highest reading was, but none of it was over 10. And most of the readings on a weekly basis for the last six months have been nondetect.

BURIL: Well, I will point out that within our own sampling we've been able to track to some degree the injected water that folks have been putting into the ground because we do see a low level of perchlorate emanating from upstream of JPL. And so the other point I think we need to keep in mind is when you start looking at the level of 10 and under, it's a real question mark in my own mind as to who that belongs to.

ROBLES: Why I bring this up is because I'm fighting with my NASA headquarters people on this issue, particularly when it comes down to the economics of perchlorate. I'm arguing with them that for our plume we need to do what we need to do, to the best of our capability, because it's a resource. But the problem comes in is that there is a question at NASA headquarters and then with the federal government about what was caused by MWD water. And there is a discussion at the government

level of a background, and that there's a point where the government takes responsibility, but MWD has to take the other. And right now I don't want to get muddled in that, but that's a key I want to bring up.

ATWATER: And of course, I mean, perchlorate is not MWD causing it in the Colorado River. It's sources --

ROBLES: The government.

ATWATER: Yeah. The government. And that's why kind of okay --

ROBLES: It's like pointing who really caused --

ATWATER: Well, and the other thing, let's be pragmatic about this. If the ion exchange performs as we --

ROBLES: Hope it will.

ATWATER: -- hope it will, and let's just assume the incremental cost between zero, and let's assume you want to argue this cost allocation just for a basis of argument between operating the system at 9 versus the nondetect of 4 or 5, the incremental cost is probably nothing. You can design the system.

BURIL: I think that if we're talking about something of how clean does the water have to be when you're finished pumping it out of the ground

and now you've got to put it somewhere, that's a separate question. That's a question I think that we would probably want to do to the highest level of performance, as Peter just said.

But when you're talking about what you clean the aquifer to, which is Mark's point, I believe, and what is your end point when you're going through and looking at your monitoring results, when do you call an end. That would be another question entirely.

ROBLES: Personally I'm not satisfied that the MCL level is what I would like to shoot for, for cleaning the aquifer because that doesn't help the purveyors of water, because they still got blending issues. But by the same token, is nondetect economically feasible, considering if we find out the catalytic system doesn't work. I'm hoping it does because I would like to have it totally working, then the discussion is moot, we shoot for nondetect.

RIPPERDA: Are we still muddling up what the water gets treated to with what happens to the aquifer? Which one are you talking about?

BURIL: I'd like to focus first on the treated water. What does that need to be treated to? And

then we can talk --

ATWATER: If it goes into a domestic system.

BURIL: Assuming that it goes to any number of things. This is where we get into a lot of variations on a theme.

ATWATER: Sure. If you spread the water or reinject it.

BURIL: We can reinject. We can spread. We can give it to a water purveyor. We can discharge it to the surface and make a lake down here at Devil's Gate Dam. The County would love us, wouldn't they? There are a lot of things that are feasible in terms of their technical capability. Ramifications in terms of economics and political acceptance and things of that nature place a whole different series of requirements on it.

But if we were to try and lump this together and say if we're going to give it to someone or place it in something that someone can reasonably be exposed to, what is the number that that water has to be treated to?

RIPPERDA: I've got two answers. One is my personal preference and one is kind of a strict legal, like federal legal thing.

My preference would be for all these

volatiles less than 1 part per billion, which really has no economic difference whether you're treating to MCLs or less, air strip, carbon. That does it.

And for the perchlorate, if you're going to -- if you treat it, you might as well go down to the 4 to 5 parts per billion, which is kind of the current accepted background or nondetect level.

BURIL: Okay.

RIPPERDA: The strict legal thing, we get this with the Army, Navy all the time, is, well, you know, we say you can only make us respond to MCLs because below that there's no legal driver. They always throw that out there and then they always go ahead and treat it to nondetect anyway.

ATWATER: Given the state-of-the-art technology, you're not going to -- you can't operate this system and shoot for, hypothetically, 10 or 15, nor would you want to.

BURIL: Well, I guess that's one of the things that we want to try to understand. Be aware that this is the first time we've ever talked about this. We have not talked to --

ATWATER: Oh, sure.

BURIL: -- any of the water purveyors with these ideas.

ATWATER: Well, I think we can use the La Puente County Water District because they have to get a permit before they utilize that system from DHS. I'll talk to Gary Yamamoto about it. That's a good indication of what they're going to use as a criteria. That ought to be your -- and I assume they'll be consistent and apply that here.

BURIL: Now, does La Puente have a, I'll term it, dichotomy of purpose? In other words, if they spread it, do they have one criteria; if they go directly to customer do they have another?

See, that's one of the questions that I would have because if I can treat to some lesser level in spread or inject, then the economics of that becomes something that we need to consider. That's not to say that we wouldn't treat it to nondetect anyway, but it's something that we need to consider.

ATWATER: That's a good question. I'll ask the Regional Board that. Would you give them a discharge permit to spread the water?

Well, you do with the spreading of reclaimed water. You have to get that. So I wonder --

CARLOS: There may be a discharge permit.

ATWATER: I'm assuming you will.

BURIL: An NPDES permit, or what?

ATWATER: Yeah. It's a discharge permit.

RIPPERDA: Especially since the only place you can spread is the Arroyo.

ATWATER: Yes.

RIPPERDA: And the Regional Board does require permits for discharge to the Arroyo.

BURIL: We have one here at JPL.

RIPPERDA: So you'd have to like fit it --

ATWATER: See, like upper districts doing the waste water project, and of course in the Montebello Forebay they permitted the Regional Board since 1961 using reclaimed waste water. I assume you would look at this the same sort of way and under the same -- you'd have to have a permit and in the past on main (unintelligible) since I worked on it since the mid '80s, I know when they talk about pump and spread normally they've applied the same drinking water criteria because then -- you have to remember under State law there's a nondegradation.

BURIL: I know. I know. But there you come to a very interesting question again as to how clean is the aquifer to start with.

CARLOS: Do you clean it at lesser?

BURIL: Well, that's it. I don't know what that is. I'm kind of probing unknown territory for myself because it makes sense to me what Mark said, treat it to the best that you possibly can is the ultimate goal. But whether that's an appropriate goal is something that you'd have to try to figure out.

RIPPERDA: We're kind of -- it's good to talk about this now, but it's also kind of just hypothetical speaking because we have no idea what the economic difference is between --

BURIL: Exactly.

RIPPERDA: -- 10 parts per billion and 4 parts per billion.

BURIL: That's one of the things we'd like to be able to figure out. But it's nice to know, if we can, what that kind of difference is. I mean, are we talking 10? Are we talking 2? Are we talking what? Because in order to make that economic evaluation we have to have those numbers, those end points understood.

ATWATER: Yeah. I mean right now you'd have to say safely, I mean, I just assume that incremental cost difference is going to be not very much.

ROBLES: I hope that is the case, because that

would help. I'm looking at it above all is we cannot impact adjudication of the water and we cannot impact the conjunctive use issue. That's too paramount in my mind, because my biggest concern is always a solution that meets our need economically but does not help the purveyors of water. We're back to square one.

ATWATER: You're absolutely right, Peter. I mean just conceptually, since we're just brainstorming this, it's hard for me to imagine that either the Regional Board under its permit or the Raymond Basin Management Board under its judgment and its role in approving -- if you pump and spread the water at 10, it just -- it doesn't make sense to me that from a policy standpoint they'd say that's okay, but then if you pump and treat and put it in the domestic system it has to be 4.

My guess is you'd want to be consistent on that because if it goes back in at 10 and you've got drinking water wells right around, I mean, it just --

BURIL: You've just brought up an interesting question in my mind, Rich, that is, in trying to determine ARARs I have been somewhat focused in trying to understand what the Regional Board or DTSC

or DHS or EPA would impose. However, you just raised an interesting specter of Raymond Basin Board having some statutory authority to enforce water quality.

ATWATER: Oh, absolutely. They always have. We've always talked to you. If you read the Raymond Basin judgment, they have clear authority from the Superior Court to protect the water quality of the basin. If you're going to artificially recharge the basin, they do have to approve that. And we've always talked about that. They do have a court mandate. And if you're going to pump water out of the basin you have to get approval from them, and then how you put it back to beneficial use.

ROBLES: That's one of the key questions that I've noticed from the first day I got here, because --

BURIL: Is that judgment truly --

ROBLES: Does Superfund supersede that?

BURIL: Is that truly an ARAR, because it's not a promulgated regulation.

ATWATER: Well, they haven't adopted a standard either, but they're certainly going to have to -- as you've already acknowledged, you have to deal with the water rights.

ROBLES: That's the thing.

BURIL: No, I don't question the water rights. I just wonder from a -- this is maybe hypothetical, as Mark was saying, but from a purely legal perspective, do you folks have a legislated statutory responsibility to enforce water quality criteria? I don't have an answer to that. I just -- to me it sounds like you maybe don't.

ROBLES: From a political perspective, if we don't take that into account, I might as well just shoot myself in the foot.

BURIL: I understand. I mean, I'm not saying I don't want to work with these guys.

ATWATER: Well, in fact, if you look at the main San Gabriel, the water master, which -- is again, it's court appointed, that's the Raymond Basin, it's not legislated. You know, it is a judgment executed originally in 1944, but it concerns all water rights in the Raymond Basin. And the court expanded that in 1978 to include protection of water quality. And so in that sense I think it's overlapping jurisdiction with the Regional Board, since the Regional Board clearly, under state law, has authority to protect groundwater basins and all that. But the court has an independent and, you

know, we can get the lawyers involved. I'll give you my simple interpretation.

BURIL: No. I don't want lawyers, please.

ATWATER: What the Board could do is go back to the court and enjoin your solution if it was something that they felt was not going to protect the quality of the basin. Clearly they'd have -- you know -- under state law --

BURIL: Oh, I understand where you're coming from, Rich. I'm just trying to understand in my own mind which number do I jump to, because from a purely legal aspect, which I think Mark was going to at first, there's no statutory authority that says that you can force anyone to go below MCL. However --

ATWATER: No, no, no. Absolutely the Regional Board has that authority in our discharge permit. They do it all the time.

CARLOS: It would depend on the basin plan.

ATWATER: Exactly. Absolutely. It's got short authority to adopt a discharge permit that is different than drinking water standards.

RIPPERDA: We're kind of ranging all over the place, but there is a slight difference there. You can't force anybody to treat to less than MCLs

for -- like discharge to human water consumption, which is a little different than some kind of surface discharge and percolation.

ATWATER: In fact, that is not true, because DHS under their permits, in fact, they've done that for nitrates, and they require systems to put it in their system at 80 percent of MCL on nitrates. And that happens.

RIPPERDA: Right. Yeah.

ATWATER: So I mean, you don't go right to the MCL. Definitely when they approve going into a domestic system they do not say you can go right at the MCL.

RIPPERDA: Yeah.

BURIL: Here is where I'm coming from.

ROBLES: This brings up the big point, which I'm glad for the discussion, even though it's been ranging wide. We need to know ARARs. All other requirements get tied into that. We need your help.

Now, we can go and develop an ARARs list and you guys can say, "Okay, you forgot this or forgot that," because I know you guys don't have the time and effort, or else we can work on a cooperative. But we need to do that. I'm glad that Raymond Basin is here because this has always been a

real concern for me.

ATWATER: That's right. I'm just saying I absolutely agree with that. My only point is in this case if you ask the City of Pasadena and Lincoln, everyone wants to collaborate, but their next question is, well, what is DHS going to let us do.

ROBLES: Right.

ATWATER: So you get in a circular argument and the Regional Board, when they do a discharge permit on impaired water, they're going to go to DHS and ask what their -- they're going to ask them for guidance, and that's another -- if you were to spread the water.

BURIL: Here is the reason for my confusion. This is something that I'll throw out here. Pete's discussion with regard to ARARs is exactly where I was trying to lead to.

When we go to develop a remedial action, we need to know design parameters to understand how feasible something is. Do I turn to an MCL? Do I turn to a DHS requirement of 80 percent of an MCL? Do I turn to the Raymond Basin and say "What do you guys want?" I can anticipate the answer will be nondetect across the board.

Those are all wildly different answers when you start thinking about the ramifications of the design of a remedial system. And we can only design to one number, basically, in order to be able to understand whether something is feasible and practical.

ROBLES: And I hope that the economics is so minuscule between those that it's a moot point.

BURIL: But that's what we need to determine.

ROBLES: But if those economics are not --

RIPPERDA: So to get very bureaucratic and use CERCLA type language -- there's all different kinds of requirements, DHS, Regional Board, EPA, Safe Drinking Water Act, all kinds of stuff. But this is a CERCLA action. NASA gets its funding through CERCLA; whatever. And so if you use CERCLA type language there's remediation goals, which is what you actually pick in the ROD, which may or may not be MCLs or may or may not be ARARs. So you have ARARs. ARARs are MCLs and the DHS 18 parts per billion have to be considered, which take into account things like 80 percent of MCL or some kind of nondegradation policy.

I don't work in California much so I'm not sure how nondeg policy fits into ARARs, but I would

think that you stick with the legislated numbers. Things like nondeg come to be considered. So you take all that into account and you come up with a remediation goal.

So I guess I would argue that your remediation goal should be somewhere on the order of 1 part per billion for your VOCs and somewhere on the order of 4 parts per billion for perchlorate.

ATWATER: But I think the way to -- my suggestion from a timing standpoint is in the next couple months why don't we have a workshop, get DHS. I think since you brought up the issue with Met, get them involved. One of the things with the conjunctive use and with the purveyors, make sure that everybody feels comfortable.

The real issue is -- and you have to admit from a DHS, and I'm not going to -- you know, there is a judgment in there of this, you know, cushion or conservatism going into a domestic system and then also with the Regional Board and DHS, talk about that number. I tend to agree. It's going to be probably the same number we just outlined. But ask DHS and the Regional Board if you were to spread it, what kind of criteria would you use. VOCs is not an issue because it will volatize off when you spread

it.

CUTLER: The wild card here, too, is the action level may change. Is EPA getting close to --

ATWATER: Absolutely. That's the -- if the 18 were to go down it makes it a little bit more delicate.

CUTLER: If it goes up it makes it less delicate.

ATWATER: Yeah.

BURIL: Do we know anything more on that, by the way, Mark?

RIPPERDA: I don't have any preliminary indications.

BURIL: They've been very mute all the way through.

ATWATER: I will say this, though, knowing the EPA drinking water, they're scheduled for actually -- finalize that is at least two to three years off. So you won't have adopted one in the time frame, Peter, where you make a ROD.

That's the -- to give you an indication, I think you're going to have to use the 18.

ROBLES: I've never seen it ever dropped. Once it's set, it's like that. I would be surprised if it --

ATWATER: The other thing, if you haven't heard, is the Governor did veto State Senator Byron Sher's bill which mandated DHS adopt their MCL at a time certain. He wasn't opposed to the concept, but they don't like having a deadline and a time certain. It's a philosophical issue about the time certain of getting DHS to promulgate their action level of 18 into a definitive State level, which you could have used, then, as I assume EPA would have, you know, in California, would have used that as the benchmark. DHS is still going to go forward. It's just they don't have the legislated mandate, which, if I remember correctly, is July 1 next year.

BURIL: I'm going to throw another wrench into this discussion for just a moment. I think it's something that we all need to consider.

With the issue of the remediation goal being foremost in my mind, I'm thinking when we do set remediation goals to deal with what we could call concentrations of any constituent which are not of JPL's doing. I could focus on perchlorate, but I won't. I'll turn to one that is absolutely not our doing and one that we do see in the wells for the City and in the wells for upstream of us, and that's perchloroethylene. We are not the source. We don't

even find it above MCL here. In fact, we find very little of any of it. And yet my understanding is that Valley Water had a real problem with that. I don't know if they still have it. But they had perchloroethylene of several hundred parts per billion here a few years ago.

ATWATER: Just one sample, and that was during the injection. But their readings consistently showed you the data's been less than 5 for the last two years.

BURIL: But even so, we're talking about having perchloroethylene showing up like -- what is it, Las Flores that's shut down right now because of perchloroethylene?

ATWATER: It's running about 7.

BURIL: Yes. The limit being 5. I think they're down as a result. But that's, for all practical purposes, not our issue.

And the question I have, then, is when we establish remediation goals, is that taken into account and, if it is, how is that done?

RIPPERDA: It's always with the caveat that it's contamination caused by JPL. So I guess I don't quite understand.

BURIL: You've kind of answered the question for

me, then, because one of the things that I would be concerned with is that if we're talking strictly about contamination from JPL, the water purveyors have a different problem then, because if the perchloroethylene issue is not of JPL's concern, then they have a totally different concern that they have to deal with potentially independently.

ROBLES: As an example, maybe perchlorate might not be a good one, but since perchlorate, cleaning up carbon tet and TCE, we're going to get the perchlorate anyway when it comes out. But let's say --

ATWATER: You mean PCE.

ROBLES: And NDMA. That's a good one. We don't have it here. NDMA. We don't have it here. But what happens if we find it in one of our wells and then since the carbon absorption doesn't treat it, since the ISEP system doesn't treat it and UV is the only thing to work, then we pump it out, clean out all the VOCs, clean out the perchlorate, but we have NDMA and the standard is nondetect, as I understand it right now, what do we do?

BURIL: Well, that's a good question.

What I was trying to get to is, is there something within the regulatory scheme or within the

way that we view ARARs that says that while the Raymond Basin has this responsibility to protect water quality, where the water quality issue is not associated with the CERCLA site, are we required to deal with that irrespective of the source.

In other words, if we've got perchloroethylene in the water, they say their water quality is impacted, they want us to do something and we're saying it's not ours, are we still obligated to deal with that as an ARAR?

RIPPERDA: Maybe I'm just like totally missing something here, but if it's not yours, you don't have to spend money to clean it up.

BURIL: Okay. That's all I need to hear.

RIPPERDA: If it's commingled, if you have something that's TCE from JPL and it's showing up at the Pasadena wells and there's also some perchloroethylene there that's not yours --

BURIL: To what extent we clean up the perchlorethylene by doing something else for our own stuff, that's fine.

RIPPERDA: Yes. Right.

ATWATER: See, you have to install an air stripper anyway for carbon tet. It would be irrelevant.

I think the better example, and not to dispute you, but I don't think there's technical documentation that you've made statements that aren't proven about PCE and the other sources, at least we wouldn't accept, but nitrate's the clear example. And that's a common problem in a lot of the Southern California Superfund sites, like in the main basin or over in Redlands, et cetera. Clearly JPL doesn't have to worry about treating to remove nitrate if that was the problem at the well. In this case, since it's the same treatment technology, I think Mark is right.

BURIL: There's no question about that. I'm just trying to understand how the different things factor in. And Mark made the statement very clear. And I'm satisfied with that.

RIPPERDA: But I think it is incumbent upon you as the PRP. Once you're established as a Superfund site everybody in the region looks to you for everything. So there is this little added burden on you to show when something is --

ROBLES: Not him. Me.

ATWATER: The federal government.

RIPPERDA: -- on NASA, actually on Mark, who is writing the document, to show when something is not

from you. So when you're talking about perchloroethylene, you know, everybody is going to assume first off, oh, JPL and groundwater.

So, in other words, without having done a review of the document, just having like looked at it kind of quickly, I think you do need to put a little more effort into the RI to try to prove some of the statements you're making, that "Perchloroethylene is not ours." You know, it's near your site, it's around your site. So that's going to be one of my comments, is put a little more effort into showing that the source is from off site because you're going to need that when you go to your FS and your ROD and people get up at a public meeting.

BURIL: We'll have to talk about that. Let's hold that discussion until we get down to that point.

Okay. What you said is good for me. I mean, I understand where you're coming from, then.

I guess what Pete said is very paramount in our minds right now, is what tune are we going to need to march to in this. That's the ARARs, and that's something that we would like to turn to you folks to and say "Tell us."

ATWATER: My suggestion, again, is get DHS involved, do a workshop with the Regional Board and EPA and DHS, and we're happy to participate, particularly if --

Since I hear Peter suggesting these issues related to MWD, and nobody knows what the historic Colorado River water had from Lake Mead, do you want to go through that analysis and hypothesize? Is that background level from contamination from JPL from 40 years ago when you see the low levels of perchlorate in the Raymond Basin, or do you want to argue that that's somehow Colorado River water that's infiltrated from irrigating lawns because it wasn't injected 20 years ago.

And the only reason why I bring that up, when you look at the Montebello Forebay on the San Gabriel River and you look at the San Ana River and Metropolitan and those districts and sample for perchlorate and they spread over a million acre-feet of Colorado River water in the 1960s, 1970s and 1980s and you see zero background level of perchlorate, it's hard for me to imagine geologically that here in the Raymond Basin because they irrigated the grass over at the park or over at Cal Tech campus or all the landscape median, that

that perchlorate, if it was in the Colorado River, infiltrated and now you see it at 4 parts per billion down at a well, you know, at Sunnyslope when you don't see any of it in Downey or Pico Rivera, where they spread over a million acre-foot of Colorado River water. The two don't add up.

ROBLES: That's a good point. That's the information we need.

BURIL: It's only good up to a point because you don't know what the concentrations were when it was spread here. You don't know what the concentrations might have been when it was spread there. You don't know.

ATWATER: No, you do. It's the same Colorado River -- if you look and it comes out of the same pipeline, we do -- you don't know what the concentration is, but it didn't show up there and they physically put it in the underground through spreading grounds, high volumes.

BURIL: In all candor, Richard, you are making a case to point to JPL as being the source of perchlorate in the Raymond Basin, and I'm not willing to accept that argument. So from that perspective, I'd say rather than get into that discussion, it's probably better that we focus on

what we do need to do here, and that is to determine what the ARARs are and begin to try to deal with the FS.

I turn it right back to you, I was going to say.

ROBLES: I think we need a meeting.

BURIL: I think there probably is a need for a meeting.

ROBLES: We need to sit down and --

BURIL: It needs to be sooner than later because we are under a gun as far as schedule goes with the FS and we want to be able to continue with our schedule as we have it now. Even though the schedule is longer than what we had some time ago, we don't want it lengthened out by having to find out that we went the wrong direction.

ROBLES: And I'm asking for a meeting not where I've been at before, an ARAR meeting where regulators come in and a drop an "Okay, this is it. Take it or leave it." That's not what we're looking for.

We need to sit down and have a real discussion, point by point. Because that's not going to help us if you just take the whole regulations and just that's the whole ARARs, because

that's not going to work either.

CARLOS: Maybe one thing you can do is, I don't know if before or after the meeting, come up with a proposal from you guys that we can take back and review.

ATWATER: What you want to do is go up in the organization at the Regional Board and have people --

CARLOS: Yeah.

ATWATER: That's one of the problems you're going to have, and I think DHS likewise, is they're not going to want to -- but I think you ought to have a workshop to talk about all this so that you get what we all -- you have Mark's one view, which I don't necessarily disagree with, but that's very conservative on the low side, and is there any possibility, some flexibility above that.

RIPPERDA: It's always much easier, when you're bringing together half a dozen different agencies, that you make a proposal this is what we would like to do rather than have half a dozen different people all kind of say --

BURIL: "We don't know, so let's all argue about it for a day."

ROBLES: So therefore, we can bound the

discussion to these areas and then discuss the exceptions that are not included or should be taken out.

RIPPERDA: Yes.

ROBLES: Okay.

RIPPERDA: Back to the discussion about perchlorate and what's due to JPL and not, you're concerned about it because you want to know what -- like rather than argue about what may or may not have been in the Colorado River water and how much of that may have been back to the aquifer, can't you just go upgradient and -- you've got all the data.

BURIL: Yes. We can do that.

CUTLER: That's basically why we think it's not all JPL's.

BURIL: We have information from water being injected upgradient from us that does show perchlorate in it. So that's basically where we're at.

I guess that's probably a discussion that we should probably get to.

RIPPERDA: We're looking at a draft -- the draft RI is not exactly what we're talking about right now, but things like background levels of perchlorate and whether or not perchloroethylene is

from off site or on site, that needs to be discussed and presented in here as a baseline for when you go to the FS.

If you're going to argue in the FS that this amount of perchlorate is not from JPL, you have to have presented that in the RI as saying this is background, you know, JPL believes that the background concentration is 4 or 6, or whatever it is.

ROBLES: And here is our data.

RIPPERDA: Yes.

ATWATER: And you provide that, you know.

BURIL: That's fair.

RIPPERDA: But so far we've discussed on some sort of remedial actions.

BURIL: We got to wellhead treatment and went crazy.

RIPPERDA: When you're going to treat it, what do you have to treat it to, but not whether or not all these ARARs apply in the aquifer. That goes back to the question what is the aquifer and all that.

So my basic -- I'll just throw out my feeling that I agree with you. Wellhead treatment. I think drilling a well in the middle of JPL or

drilling several pump and treat wells in JPL is not worthwhile.

BURIL: Is not worthwhile.

RIPPERDA: Right. You know, maybe you have to add one or two wells to like close some kind of containment.

ROBLES: Hot spot removal, maybe.

RIPPERDA: Or hot spot removal. The data I've seen, although MW-16 has maybe a hot spot in what might be a perched zone or something.

ATWATER: Have you done enough modeling, would you get the same benefit if you just used Pasadena's Arroyo well? I'm just thinking just from a physical --

BURIL: That's part of what we're looking at. There are things that we're thinking about where we would just use the Pasadena well as a remedial well. There are ideas where we would draw enough of an influence to basically contain everything here on site irrespective of what goes on off site. There are lots of variations on those themes.

But it sounds to me like, at least in concept, we aren't talking about anything which is completely off base when we're talking about something like this. The need for on-site removal

versus utilizing downgradient off-site wells, that's something we would have to look at and see whether we'd really gain any benefit as a result of having an on-site well to hit the, let's say, possibly the hot spot of Well 16 or maybe something at 7 or well whatever. But it doesn't seem to me like we're off base when we're talking about this. That's principally where most of the things that we're looking at focus on, is some variation of the theme of pump and treat.

ATWATER: Yeah. I agree. As you know, City of Pasadena is conceptually open, I think it's fair to say, if you were to take two or three of these hot spots and just then pipe it up to their treatment plant, if that is a more economical way to install the ISEP system.

BURIL: I think they are open to cooperating with us in whatever way makes sense.

ATWATER: And I think all that, then, avoids a lot of these issues that we've kind of framed, which all need to be discussed. And then if you did that, getting -- then you can design a pump and treat system that goes into the domestic system that provides enough conservatism and comfort. Because going into the domestic system you want to have

enough -- if you will, build some suspenders to assure that you don't have, you know, any variations.

BURIL: Okay. I think we've covered about as much on conceptual remedial action as we need to at this point. What really came out of that discussion, and I'll try to paraphrase it as briefly as I can, is that we need to get together and get the ARARs established so we know what we're dealing with. I know Foster Wheeler is over there in the corner sweating bullets as to when is that going to happen, because they've got the gun to their head to meet schedule, as do I. But they're the ones who are going to be physically doing a lot of the work.

I'm going to propose that we try to get together before the holidays. I don't know what date that might be. I have to look at my own schedule and try to establish a few things, and we have to talk to other agencies, like DHS, to become involved.

ROBLES: This is a very hot issue for me. Would it be better if we meet in Sacramento? It would be easier for DHS, DTSC.

BURIL: I think it's a question of who are the players, first of all, because I'm not sure I

understand who all the players are. I mean, you've got three principal ones right here. But when we talk about DHS, are you talking about DHS at the local level, or are we talking at the State level?

GEBERT: They're at the local level.

ATWATER: They're in L.A., downtown. I mean Gary -- that's who you ought to have.

BURIL: I'm figuring Gary would be the right person, but I'm not sure.

ATWATER: Exactly.

GEBERT: It should be held here.

ROBLES: Okay.

ATWATER: Particularly if we go back to your suggestion that we ought to probably use this as a workshop to put it on paper and each of the agencies -- I mean, Gary is going to run it up to his superiors at DHS, and likewise the Regional Board. I mean, in their case, you know, even the executive officer is still subject to board approval and public hearing and all that sort of thing on the discharge permit. At least recently your board has been making some independent decisions on a few things, right, so --

BURIL: Okay.

RIPPERDA: So to summarize yet again, in my

terminology, you're going to get to us a couple of tables, a table of proposed ARARs if it's going to be discharged to a public water supply, proposed ARARs if it's discharged to the Arroyo, and then any other ARARs.

BURIL: We have a few conceptual ideas here. We'll be looking at those. I think we'll probably firm up the kinds of things we're thinking of and the associated ARARs and let you take a look at that.

RIPPERDA: Because the ARARs are different if it's discharged to the Arroyo than if it's discharged to the public water supply system.

BURIL: That's what I thought it would be.

RIPPERDA: So you break it out like that. You get it to us before the meeting so we're not just sitting down at the meeting discussing it. But if Gary has to check with his management, if the Board needs to talk to DHS to see how it interacts --

CARLOS: Then we can bring that.

RIPPERDA: Yeah. So --

BURIL: Let me offer this, then. I'll take the action to establish that meeting. But before I try setting dates, I've got to sit down with my consultants and NASA and figure out how we're going

to come up with this list before we set the meeting. We're going to do that right now, I mean quick. And then once we understand how long that will take, we can try to plan out when to get the meeting in place.

I would very, very much want to have this entire issue settled before we all go off and enjoy Christmas or whatever other holidays there are there. So --

ROBLES: I think before Thanksgiving, because they're not off for Thanksgiving and Christmas. They're working.

BURIL: Before Thanksgiving is, I think, overly ambitious. But we can sure shoot for as fast as we can go.

RIPPERDA: I never had such problems. Everybody treats this like it's going to be horrendous. I've never had a problem with ARARs. It's like you just prepare the table, get it to us, we look at it, call you back.

BURIL: Sounds good to me.

RIPPERDA: If there's a huge disagreement, you have a meeting. But, you know, it's like I guess -- what would be a problem? If the State of California says it's nondeg, you've got to have nondetect, the

ARAR is nondetect and you disagree with it. But otherwise --

BURIL: No, that wouldn't be an issue. I don't know that there is a real problem. I think what we're looking at now is just a concern regarding the immediacy of need. We've got to know now in order to continue on with the project and not delay it any more than what we might otherwise anticipate. So I think that's really where we're coming from.

ROBLES: I think the biggest problem for me is that my ARAR experience has been like yours. It's not a big deal. The problem is what ARARs apply to what kind of remedial action.

CUTLER: That's the level of detail that we need.

ROBLES: That's the level of detail that we need. In this case this site, to me, has more options that we have to present to the public in a record of decision. And part of the economics as well as the political decision has to be what ARARs apply, what can and can't we do here. And so therefore, that will immediately drop out some of these options. What I'm hoping is we still have enough options left over that it looks like a decision that we're not slanting it one way or the

other. I don't want to come up and say, well, the ARARs says this is it, because I know somebody out there is going to argue it. That's where my problem lies.

CUTLER: I think the ARARs are pretty straightforward. I think the confusion here is the things like the Raymond Basin input, the VOCs, things dealing with adjudicated basin issues. We don't really understand some of those. The basic MCL things are obvious and a lot of the State and federal regulations are pretty straightforward.

ROBLES: I would recommend that we send that list also to Mr. Atwater.

RIPPERDA: I guess I assume everything we talk about goes to --

BURIL: Yes. There's no problem with that. There's no problem.

Okay. Why don't we leave the idea of conceptual remedial actions behind for a moment and get back to something that's a little less ethereal in nature and talk about the soil vapor extraction tests that we've got coming up.

Basically, the system is set and just about ready to throw the switch and go. There are some coordination issues between our first soil

vapor sampling or periodic program we're going to put into place and when we fire that thing up. And those are getting worked out.

We also have an interesting problem with noise we have to try to figure out. When this thing runs it sounds like a jet engine revving up to take off. Just missing the afterburner, I think, is the only problem that we don't have here. But we are basically just about ready to kick this thing into gear.

Its running time for the overall test is, what, just around eight months, Vitthal?

HOSANGADI: Eight to nine months.

BURIL: So we'll hopefully get a lot of good data from that. In a manner of speaking, it's even an interim remedial action, although we aren't calling it that because we don't want to go through that heartburn. But it is going to be affecting some cleanup. We'll hope that it's very effective and maybe even be something we can turn to and say, yes, we want to get this going full time forever, "forever" meaning for as long as it takes to get the vapor out of the well.

We have the availability to take you up and let you see the system. It's not much to look

at. Two carbon canisters --

HOSANGADI: Four.

BURIL: Four carbon canisters, a blower and some piping. We can show it to you as we drive by coming back from the pilot for our Calgon plant. There is quite a bit to see there. And then we'll be sharing with you the data as that develops over the course of time.

CARLOS: Which well are you using to pilot test?

HOSANGADI: Same. SVE 1.

BURIL: The same one we did for the preliminary tests. We're only focusing on screens B and C, though.

HOSANGADI: Primarily. Those are the deeper screens.

CARLOS: And you plan to figure out, take your baseline sampling?

HOSANGADI: Right. That's where the coordination comes in. I want to wait until the October soil vapor monitoring program is completed, then start mine so we can use the drops in the VOC levels also as a measure of radius of determination, or radius of influence.

CARLOS: You're using an on-site lab for that baseline?

HOSANGADI: Yes. Whatever is going on as part of the soil vapor monitoring.

BURIL: That's a good point. The baseline for Vitthal's work is actually the first quarterly soil vapor sampling that we are starting up. And the soil vapor and water quality monitoring are going to be going pretty much right along in step with each other all the way through until such time as we think we can let it go.

Basically, I think that's about all we need to tell you on the soil vapor extraction test, unless any of you have any questions. It's ready to go, and we're just going to get our baseline and throw the switch.

CARLOS: If you can let us know when you plan to take the baseline measurements.

BURIL: Those are tentatively set to start next week, aren't they, B.G.?

RANDOLPH: Right. Monday.

BURIL: We've got some hitches that may cause a delay in that, but probably no more than a week, at the very most, if there is a delay. But my guess is that we should have our hitches taken care of by the time, hopefully, this meeting is over, and we'll proceed on schedule.

CARLOS: So they go for a couple of days of sampling?

BURIL: Is it five days, B.G.?

RANDOLPH: It will take about eight.

BURIL: Eight.

NIOU: When will you send us some operational report or SVE report, something like that?

HOSANGADI: You mean for what we are starting up?

NIOU: Yeah. I know you are continuing on that, but maybe some operational report would be good.

BURIL: What would be useful to you? My first thought is that after this has been operating for a while, and we can define what that is, it may be useful to you to have an interim report to say how it's going? Is that what you're thinking?

NIOU: Yes, just so we have data to see what's going on.

BURIL: I don't see that as being a major problem.

HOSANGADI: You've already seen some of the drafts from the previous stand well, basically, expanding on those, for example, as you go along, in terms of responses, in terms of flow rates, what the concentrations have been coming out. We are

tracking that -- or we will be tracking that on a regular basis as we go along.

NIOU: Yes, but then what I'm asking is like a data report, so far what's been going on and --

ROBLES: An update.

NIOU: Yes. Exactly.

RIPPERDA: A status report every three months or something like that.

HOSANGADI: That shouldn't be a problem at all.

BURIL: Why don't we just establish that, then, that we'll -- I'm wondering whether -- let's see. Let's say nine months. Let's just call that as the length of time. If we gave you a midway and a final, would that be sufficient? You kind of know what's happened halfway through and then happened from there at the end? Is that sufficient? Okay.

Why don't we plan on doing that, Vitthal. Just pick a point halfway through and we'll generate an interim report that lets people know how things are working.

CARLOS: I'll probably call you and arrange -- I'd like to come out while they're doing the baseline sampling.

BURIL: That's fine. Not a problem. More than welcome.

Yes, B.G.?

RANDOLPH: Baseline sampling is simply the same thing that we've been doing the last two years.

BURIL: If he wants to see it, that's fine. We'll bore you. It's no problem.

Okay. Any other questions on the soil vapor extraction?

The next one is why I love coming to these because it reminds me how much work I might have to do in the next month.

I'd like to turn to each of the agencies now and just have each of you in turn identify for us any major comments.

Mark, you kind of started there when we were talking earlier. If I could ask you to start over and expand upon those as well as any others that you might have, that would be very helpful to us.

RIPPERDA: The first question, I'm not sure how we ever resolved this in the past, but I think it would be a good idea if Raymond Basin got these in draft.

BURIL: We had agreed to give them a draft-final.

RIPPERDA: Draft-final. Okay.

ROBLES: Yes. After we've incorporated your comments, they will get a draft-final and everybody will have a chance again to get a draft-final.

RIPPERDA: Okay.

ROBLES: What we wanted to do is make sure that it met what you need and then therefore Raymond Basin would see a product that had all of the anomalies between us out and therefore they could make their comments as appropriate as they need to.

BURIL: Recognize that -- I'm not sure this happened while you were on the project, Mark, or subsequent to your coming, but NASA is only seeing this report for the first time while you guys are seeing it. And so we've got a lot of people who are going to be raining comments on us and our sponsor hasn't even had their say in it yet. So we wanted to be sure we had everybody built in before we let Rich, and whoever else wants to, see a copy at that point.

RIPPERDA: As long as they get a draft-final. I realize we've had this discussion before.

BURIL: Sure.

RIPPERDA: NASA is afraid of somebody out kind of in the public getting a draft. But Rich knows more about background levels of perchlorate up and

down the basin than I ever will.

ROBLES: That's why we wanted him to get the draft-final, because once we get all the wording and everything else, then the technical, because that's what I value Mr. Atwater for, is making sure Raymond Basin's inputs are voiced.

ATWATER: What is the schedule for doing the draft-final?

BURIL: The agency comments are due back to us --

CARLOS: November 11th.

BURIL: Thank you. I'm going to have to dig this thing out. Thank you. They're due back to us November 11th. We then have 60 days to provide a response-to-comments document, as well as the draft-final report itself.

That draft-final report is due --

ROBLES: 10 January.

BURIL: I think it's the 15th of January for the RI. Let me just double check here.

The draft-final RI is submitted to the agencies on the 15th of January.

ROBLES: Okay. 15th of January. That's when Mr. Atwater will get his copy.

BURIL: Right.

ATWATER: You said 15th of February?

BURIL: Of January.

ATWATER: Excuse me.

BURIL: Once we receive the comments from the agencies on the 17th we have 60 days to respond. That's as mandated by the FFA.

ATWATER: On January 15th we send it to DHS too? I'm just thinking that if --

BURIL: They aren't part of the scheme. I would turn to Peter and say what do you want to do?

ROBLES: I have no problem with it.

ATWATER: I'm just thinking, when we do this workshop and we do that in the next three or four weeks, you ought to ask Gary when he comes to the meeting if he'd like to. He obviously doesn't have a shortage of things to read, but it's probably not a bad idea to give him a copy of it.

BURIL: I don't have a problem. That's fine.

ATWATER: I just think that might help in that discussion.

BURIL: Okay. Mark, do you want to start again and hit those same comments and expand on them, if you can, and go through?

RIPPERDA: Okay. I'll just hit the major conceptual things, not little detail, just those in

writing.

BURIL: Sure.

RIPPERDA: So again, what I said before is the RI should provide a basis of any argument you're going to make. So if you're going to say that perchlorate, there's a certain level that you consider to be background or from off site, you have to present that data here in a way that it will support that argument.

And the same thing for perchloroethylene or anything else like that. You have to step off site and present off-site data in a way -- maybe in a section heading, like Potential Sources and say Off-Site Sources and make an argument why you think those are off site.

BURIL: Okay. We can do that.

RIPPERDA: I know that you've got different OUs, your vadose zone or your soils, and you've got groundwater. But there is a connection between the two because mostly the only reason you care about soils is their impact to groundwater. So there should be at least a little bit in here on potential source areas on site. Like you mentioned them in the executive summary. You say the cesspools, and you need to talk about perchlorate being used in the

region and stuff like that.

But I don't think -- and I haven't read this, really. I've only kind of looked through it. But the contaminated or the more highly contaminated perch zone around MW-16, I didn't really see that discussed in here. I wasn't really looking for it in detail.

BURIL: It's there.

CUTLER: It is in there.

BURIL: There's not a long, lengthy discussion about it, but it is there.

RIPPERDA: Okay. I guess I just didn't see it. When I was looking at the MW-16 data it was only the aquifer data. And when I was reading through Chapter 4, which was the contaminant summary, I didn't see it in there. But I'll read it again.

BURIL: Check through it, because I know that it's there because I remember making sure that we did have something built into this.

CUTLER: I believe it's a separate subsection. It's got a separate heading.

BURIL: I'm not sure that it's in Chapter 4, though. I can't remember. But it does have a separate section that discusses principally the perched water.

RIPPERDA: Okay. So that takes care of one thing. Sorry.

Along those same lines, maybe it's here, maybe it's not, but just kind of a source discussion. That would kind of fit into some of the areas that you've got off-site sources and on-site sources. So you can use that little section.

BURIL: That's a good segue into that discussion of what's background and what isn't when you start talking about sources.

RIPPERDA: Right. So for on-site sources you discuss the cesspools and that you've investigated them. It's a part of another operable unit, but you just give a really brief summary of what you found and what its potential impact to groundwater is, the MW-16 perch zone, which you already have, and the off-site sources. So that's what I found in that.

Let's see. This is kind of getting really conceptual, but the important questions that are going to come up out of the whole CERCLA study are what's JPL responsible for and what's the potential repercussions. That gets discussed more in the feasibility study. So again, this just has to say what's there, what's from JPL and where is it likely to have gone or go. So that's kind of looking

downgradient, how much has been impacted by JPL.

BURIL: I guess I'm trying to understand what additional information you might want to see there. I'm not picking right up on it. That's the problem.

RIPPERDA: Right. We're just kind of conceptually talking about the RI. If you want me to go page by page, I could go to page 111, fluoride, how come that's -- but we're not doing that here.

BURIL: No. No.

RIPPERDA: So I'm just kind of throwing out ideas that -- it's almost more like that's what I'm going to be looking at when I write my comments.

ROBLES: Mark, I agree with you that we need to look at what has been generated from JPL and where is it going to. But the key case is that these documents are focusing on the NPL site.

RIPPERDA: Right.

ROBLES: I get a feeling that you want us to go beyond the NPL site.

RIPPERDA: I want you -- to me the NPL site is wherever JPL contamination is. This document has provided data to delineate that. I think it does pretty much, but then I always hear you throw the argument of, "Well, this isn't from us so we don't

have to clean that up," or "The background is 10."

BURIL: But you're not seeing that in the document.

ROBLES: You want us to show it and prove it.

RIPPERDA: Right.

ROBLES: Okay.

BURIL: That's fine. That's good.

RIPPERDA: That's my basic overriding comment.

ATWATER: Let me ask just a historical question. Do you go back and try to document the newspaper articles that claim that in the '40s and '50s JPL projects that were testing, you know, rockets and the other facilities that were fired in canyons along here and is that -- I mean, when you go back and you say you attribute some of this background perchlorate, I'm just trying to -- you know, but that also -- there's an oral history, and I don't know how well it's documented, that a variety of JPL projects, you know, tested rockets in different canyons. I don't know how --

BURIL: We have no way of tracking that down.

ROBLES: I have been privy to a lot of documents because of the PRP litigation, or should I say negotiations that were had with the Army and Cal Tech. I had the privilege and honor to go down to

downtown L.A. and look at 165 boxes of documents all the way to 1936. And I was looking for that with four guys from the Department of Justice, and we couldn't find anything. It's all focused on JPL here exactly.

We've heard those rumors. We've tried to look at them, and there is a meeting in the future with the Army Corps. We are getting a contractor in the near future to look at the universe of documents.

ATWATER: It's really hard to document that stuff.

ROBLES: Exactly. Because what we find, Rich, is that usually you get this onion skin contract, 1940, when it was under the Army black world, "Test Rockets." That's it.

ATWATER: And you can't find where they did it, what they did, what chemicals they used.

ROBLES: Exactly. We definitely have tried, and we're pursuing looking at these documents. And all we can see is focused on what was done here. And that's what we -- but we have always been looking for other areas that might have been impacted by government operations, but --

ATWATER: In the pre-'57, '58 NASA.

ROBLES: Because our goal is to go to the Army and say, "Hey, it really happened under your watch, guys."

ATWATER: Well, you've all seen those newspaper articles where they interview and the old oral history and it's all anecdotal. But there's no data. At least it's hard to find a paper trail.

BURIL: I'll share with you an anecdotal piece of information I heard from some of the, quote-unquote, oldtimers here at the Lab who have since retired and so forth. That was back in the '60s, '70s and even up into the '80s, it was still long before environmental issues became a concern.

They used to have what they'd call a document purge where all the documents for a given project, no matter what they were, were simply eliminated. They were thrown away because they just didn't have the room to be able to hang onto them.

ATWATER: You know what you're going through right now with your eight filing cabinets.

BURIL: Yes. Exactly. My office has been in existence now for just about seven years. And we have just about run out of lot a of space to hold a lot of stuff. We are going to start archiving and doing things like that. But when you try to do the

paper trail as you're talking about, we've done that, and what we find is that we've run squarely into a wall that says, well, all those project documents kind of went away, because we don't keep purchase requisitions and we don't keep other types of documents that might say, well, we bought this much trichloroethylene at this particular time. They just don't exist.

ATWATER: There would be no reason why in the '40s, '50s they'd even document these sort of things anyway. Right?

ROBLES: We're going to Laguna Niguel, we're going to the St. Louis repository, we're going to (Unintelligible) repository, we're looking at all the subcontractors, we're looking at what we have here, up at Edwards because we used to store stuff at Edwards. We're going to the Corps, we're going to Cal Tech archives. We're going to everywhere to look for all these documents, because the bottom line issue on the PRP allegation is to sit down between NASA, Cal Tech and the Army and say who is responsible for the money. That's the thing.

So we have looked at that, and so far, my limited -- I haven't seen much on anything done, outside of here. I see a lot of documentation about

JPL/Edwards facility. And we do have that as a Superfund site under the Edwards cleanup. But that's the only off site that we have from any operations here.

ATWATER: The only other one is, I know Metropolitan, you know, just centralized here, they're more than happy to cooperate because if we can historically attribute, again, some background level of perchlorate that is as a result of using Colorado River water here, my only point is but when you compare it to the other parts of the region you don't see it, it begs the question.

But if you did want to make that argument, they're, of course, going to go back to Las Vegas Wash and Lake Mead and if there is some historical document of that use in some -- I don't know how you'd even bottle and extrapolate what Colorado River water was 20 or 30 years ago. I used to work in Las Vegas 20 years ago, the Henderson (Unintelligible) and BMI and all that sort of stuff. They don't have very good records either, going back.

BURIL: They don't have any.

ATWATER: They started -- they constructed that facility towards the end of World War II so it's

been around almost as long as JPL and who knows what's going into Lake Mead. You assume, with the volumes and all of that, there is a lot of pollution.

So if that becomes an issue, then we ought to ask and figure out a way to do that homework, too. I don't know -- because I know EPA is looking at that site and they've got a program there and we want to take that data, too, because that would be another PRP issue.

ROBLES: Right.

BURIL: Was that everything you had, Mark?

RIPPERDA: Yeah, although along those lines, I don't want to go to all that effort in the RI. To me it's like go upgradient and take some perchlorate measurements and present those. That at least describes what's here and now, and you know what's on site and what's off.

BURIL: His question or his points, I think, were more related to who is responsible, and yours are more related to what do we have to deal with now.

ATWATER: Yes. The good news is let's look at all the data, but right now, my impression, I don't have it in front of me, is that the background level

in the basin, after the last year of sampling, is, relatively speaking, at the nondetect range of perchlorate in the 4 to 5 range.

BURIL: We'll check that. We'll check the number.

Is that it?

Richard, how about you?

GEBERT: I don't have any comments on the risk assessment yet. I'll defer to our toxicologist for that.

BURIL: All right.

GEBERT: And as far as the RI, I can kind of reiterate what Mark had to say, that as far as the TCE and the PCE plumes, we don't feel that you have really proved your case on either one of those that there is an off-site source or that JPL is not the source of at least part of those plumes.

Also, there was one item, I haven't read through the whole document, but there was a -- referring to one of the source areas, there was a catch basin which was removed, according to a 1990 document, and that's the first I've heard of that. I was wondering if you're going to instruct us if that's been looked at as a potential source area.

BURIL: Yes, it was.

GEBERT: It has been?

BURIL: Yes.

GEBERT: Because I don't recall any sampling there or --

BURIL: Which boring number was that, B.G.?

ROBLES: Remember we did that for his predecessor.

RANDOLPH: We've got three of them down in that area.

BURIL: Yes. I want to say it's number 34 or 36.

GEBERT: Okay. If that could be presented --

RANDOLPH: 35 was on the south side of the road. And we had another one up there that we even drilled through the old cement slurry that they poured in to fill the excavation. We drilled through that. We've got another boring down in the street. We've had soil vapor probes up there. We've got soil vapor wells in the area for the initial 24 holes. And this was discussed very thoroughly, with the results given from all the materials that were found in that destroyed catch basin or discussed in the FSAP and the RI workplan.

GEBERT: All right.

BURIL: And if you look through some of the data

that we've handed out, I'm not sure whether you personally got it or not, but data that was handed out during the course of the investigation, you should have copies of that and you should be able to draw a link between the locations and the data that we've supplied so far. If you can't find it for whatever reason, let us know. But we've looked at that. That was a major issue for us.

GEBERT: Right, because it had high levels of 13,000 of carbon tet.

BURIL: Carbon tet, yes.

RANDOLPH: That was in the sediments that were contained inside the catch basin.

BURIL: Right.

RANDOLPH: It was almost like a sand trap, too.

BURIL: We recognize that as being a real potential concern.

GEBERT: But it was looked into?

BURIL: Absolutely.

GEBERT: And you have data which eliminate it, basically, as a source.

ROBLES: Your predecessor made a real big point about that.

GEBERT: Okay.

BURIL: Okay. Anything else, Richard?

GEBERT: As far as major comments, no. No. It has all the elements in there that it requires.

BURIL: So then a reiteration of Mark's concern with regard to giving a better delineation of what's background, what is it and why do you believe that to be the case.

GEBERT: Correct.

BURIL: Alex, how about you?

CARLOS: I made a quick review of the RI. Really, no major comments from -- again, I'm still going through it in more detail.

BURIL: Nothing that you saw that was --

CARLOS: I didn't see anything blatant.

BURIL: -- blatantly wrong, like no, you didn't do this right, you plotted the groundwater flow direction backwards, guys. Nothing like that?

CARLOS: No.

BURIL: All right. Well, that's good.

Go ahead. I'm sorry.

CARLOS: Baseline risk assessment, we don't have a toxicologist in house.

BURIL: You folks wouldn't be offering comments on that anyway, then, would you? Or are you?

CARLOS: We may.

BURIL: Okay. That's fine.

CARLOS: But we're going to defer the toxicologic evaluation to DTSC.

BURIL: Okay. That's fine.

CARLOS: The only question I have for one section of the risk assessment, when you look at the exposure point concentrations, you use the most recent data, February '97 to February '98. But I didn't see any reasoning why you selected that data as opposed to considering all your groundwater monitoring data. You have I think a ten-year groundwater monitoring information.

BURIL: I think the principal reason is because that's what we're dealing with right now. I mean, that is the current situation that we would ultimately have to evaluate how to remediate. And that's basically it. If we were back a few years, I would be using the most recent data then.

To try to develop an FS and deal with the issue based on data that isn't the most current I think would be a fool's errand, honestly. So that's why we focus on the most recent data so that we understand exactly what it is today that we have to deal with.

ROBLES: Particularly the fact of perchlorate. The past data doesn't have the perchlorate.

CUTLER: I'll make a comment, too, that that's actually more data than most RIs have, is a year's worth.

NIOU: I have a comment related to this. I understand that this is more current data, but I say, if you use at least '94 data, that's the old RI after the workplan being approved, to incorporate into that, then you can at least establish some trend at certain wells, like MW-7, MW-16, 13. You can have some trend so that we can see historical trend at least several years instead of a very short time span that trendwise we cannot see anything.

CUTLER: Well, there are graphs in the RI that do plot that.

NIOU: It's only '96, '97 data.

CUTLER: Oh, for this here.

NIOU: Yeah.

CUTLER: That's because in '94 it was back when OU-1 and 3 were separate. In '94 only the OU-1 wells were sampled. The OU-3 wells weren't even installed yet. Then in '95 only the OU-3 wells. So to make a plume when you only have half the data, it just didn't make sense. So we went back as far as we could to where we had a complete round of sampling with on and off site.

NIOU: I mean the historic -- this histogram, where is the concentration versus time from '94 to now at a well, at, say, MW-7 or if you -- I believe '94 you did sample at all wells.

BURIL: Steve, let me ask a question. What would be the value of that other than just understanding that it's gone up, gone down, stayed the same? Some of that's there, but I'm not sure that it -- personally I'm not sure how that would play into a remedial action decision.

NIOU: Of course. You trend. Your trend. If the trend is telling you it's naturally going down, then you don't have to do anything.

CUTLER: We figured we had --

NIOU: But if the trend is going up, then your source you're contacting, that you have to do something.

CUTLER: Here are the data. We sampled twice in '94. We didn't have all the on-site wells installed yet. We didn't have any off-site wells. Then we didn't sample those wells again until '96. And then in '96 it was more of a quarterly thing for two years. In '96 we sampled, '97, and then the first part of '98.

So we have probably 90 percent of the

data, but we just didn't tack on, apparently, in those graphs, maybe data that was two years old. That was only for part of the plume.

ATWATER: Mark, you can get from DHS the drinking water well since the mid 1980s with AB 1803 and then Title XXII. They've sampled every quarter, generally, since the mid 1980s at Lincoln and Pasadena wells. If you want to do what you suggest, you can use --

BURIL: Let me point out, though, that that data would not fit very well into our data. The reason is because our data is looking very specifically at certain layers within the aquifer system here. The well data that you're talking about would be some mixture of all of that.

ATWATER: I understand that. But from a trend line it's for a different purpose. But if you want to see a trend of the historical concentrations --

BURIL: If you look at just that one well.

ATWATER: That's right.

BURIL: Okay. I thought you were saying you wanted to help blend it into the data.

ATWATER: No. I'm not getting into that debate about the multi layers and all that and how accurate that is. But you're right. The production wells

don't --

NIOU: Also, all those data are RI data all related to this. I think you should present all data.

BURIL: I believe it is.

CUTLER: It's all there. It's all there.

NIOU: Not in these graphs.

CUTLER: When we did our contour maps we picked early '96 and then early '98 to try to show a trend analysis.

RIPPERDA: I agree with both these guys, that I wouldn't want to see contour maps back in '94 when you have limited data. But for a histogram or a history plot like this, if you got '94 data, you should include it. And I would also want to see separate from your multi-layer analysis and all that exactly like Richard was saying. This kind of ties into just sitewide, on site, off site, what's the production well history upgradient, what's the production well history downgradient. So if you have access to data for the Pasadena wells, for Lincoln Avenue wells and for anything that's upgradient, you should include those.

ATWATER: The other reason, and I think -- I haven't looked at the data in a long time, but my

general sense is the trend, for example, at the Arroyo wells that you put on the air stripper project in '90, '91 whatever, if you go pre and post and you look at the influent data from the wells, from the other Pasadena wells, the trend line has been declining slowly over time. That's something that you ought to show, is that the municipal wells, the trend line for the volatiles has been trending downward.

CUTLER: I think you can see some of that with the data that's there.

ATWATER: Okay. Why not show the whole -- since AB 1803 when they had the intensive sampling, you're testing my memory, but I think that's 1986, you know, all the wells were sampled, all the drinking water wells in the basin. It goes back to your argument about, you know, PCE. If you want to argue that PCE is from another source, why not display that data, all the drinking water wells.

CUTLER: Your point is well made. We can discuss it.

ATWATER: All it is is collecting the data and putting it in a format that --

BURIL: One thing I want to point out.

ATWATER: It's not a big task.

BURIL: I think it is, though. I think you're talking about a fairly large amount of data that we're talking about here at JPL. We have an awful lot of data.

ATWATER: Oh, do you?

BURIL: Yes, we do. We have reams of it. Groundwater wells from a purveyor's standpoint may be a little easier.

ATWATER: Sure.

BURIL: I think that developing something like that, I'd have to turn to these fellows and say "How fast can you do it?" We're looking at basically 90 days, in essence, to come up with all of that, include that, and then still respond to your comments, provide a response document and so forth. I don't know that it's a monumental task, but just in my own sense of how much is out there from our own data perspective, it may be a big task. I don't know if we can get all of that done.

CUTLER: Right. I don't want to belittle these points. They're very valid.

BURIL: They are valid points.

CUTLER: But in my mind, this is just a personal view, we might be at a point of diminishing returns because of the amount of data we have there. The

original plan was going to be two events and we'd go to an RI. We've been collecting water level data and chemical data since '96. So we have what you want, I think, with recent complete data sets.

I'm not saying we won't do it.

RIPPERDA: You just said you have what we want. You have what you want, maybe. But I actually do think that -- well, it's going to be in my written comments that I would want to see '86 or whenever it's available from the Pasadena wells, Lincoln Avenue and a couple of upgradient wells. And whether that's just plots you get from one of their reports and just slap it in here without putting it into your own computer database and generating it yourself --

ATWATER: It's pretty easy to delegate with --

CUTLER: The '96 data is there. All the City data is there. I mean all the purveyor data for '96.

ATWATER: Sure. All we're talking about is the historical -- get the historical trend back.

BURIL: Mark, I have some of that already in a database. How complete it is I don't know because it only goes up to '93. After that we don't have it

in that particular database. I'm sure it's available at other locations.

RIPPERDA: Actually, I'm going to harp on this because this is stuff that ever since I've come on this a little while ago it's something that Richard has mentioned and I like reiterate what he mentions at every single meeting. It's like we would like to see this data because it puts JPL in perspective into the Raymond Basin. When I go to look at a site, like in the first 15 minutes what I want to look at on any site is your contour maps and some kind of historical data on groundwater quality. You've got great contour maps, you've got great recent data, but I would still want to see some historical perspective of the local water purveyors' wells. I think it's important.

BURIL: That's good to know up front. We'll start pursuing that.

CUTLER: Just in all fairness, too, it has taken us quite a while to get that data. We have tried many times.

BURIL: Since Rich has been helping us, it's been better. But in all candor, we have had certain problems with them. To call them reticent to provide data would be giving them a great

compliment.

ATWATER: Yeah. That's right. And we want to get all that -- all that information is public records, in fact.

BURIL: In fact, that's where we went to get it finally.

ATWATER: In fact, DHS, and it's not -- you know, it's not -- it's not easily retrievable. But you got most of it now, don't you?

CUTLER: I have to double check. Do you recall, Mark, how far back? The stuff you're talking about I think '93 to '94 and then we covered it at least from '96 on. The early '94 and the '95 I don't know if we have.

LOSI: I don't remember.

BURIL: I've got some analytical data going all the way back to '83. I can share that. I mean, you should have that, but let's just be sure that you do. It may be that that's what you utilize. And if it's incomplete, we can make it more complete down the road. But certainly that would give you that kind of historic trend that you're looking for.

CUTLER: If you want, we'll do it.

BURIL: All right. We'll get after it.

Anything else?

CARLOS: No. That's all I have.

BURIL: Okay. Judy, did Kathy bring in the schedule?

Let me ask, now. This discussion may go a little while. It's straight up noon. The Lincoln Avenue thing won't take a lot of time, I don't think. But we do have a couple of things under Other that we wanted to bring to your attention. How does the group feel? Do you want to press on? Do you want to take a 45-minute break for lunch and come back? What do you want to do?

RIPPERDA: I vote to press on.

GEBERT: I do too.

BURIL: Fine. Not a problem.

Judy, do you have that from Kathy there? Why don't you go ahead and bring it in.

RANDOLPH: Can we take a 10 or 15 minute?

BURIL: Why don't we take ten right now and we'll go from there.

(A recess was taken from
12:00 noon to 12:19 P.M.)

BURIL: What we've done is we've taken the schedule and we've included the extended pilot tests and factored those into the deliverables for the FS and so forth. We have an overall schedule here.

This goes all the way out through ROD for all operable units, the one up here. And it's just a summary document or a summary of eight pages like this. If you want to see detail, we have it here. If you'd like to come up here and take a look at this, that's fine too.

I took and just pulled out the big ticket dates from this and provided it to you so you could see where we were.

Basically, we show -- I've only gone through FS on this. This one actually goes through proposed plan and ROD. But I figure this is enough heartache as it is, with the proximity of all these things come together. But you can see we've got ten documents in the next, basically, year and a half to 20 months; whatever.

This is just the deliverables under the Superfund. You're going to get five other reports each year for the quarterly monitoring that aren't on here. They're up here. And you're also going to get other reports from the soil vapor monitoring. So you have a potential of seeing, over the course of the next year and a half, somewhere in the neighborhood of about 30 reports rolling into your offices on various facets and monitoring, and so

forth.

In general, what we've done is once we've gotten to the RI draft, we're locked into the 60-day time frame that's established by the FFA. And we've got the RI for OUs-1 and 3 already in process. The draft-final for that is due back to you folks after we get your comments on the 15th of January of next year. And unfortunately for us, that runs right through the holiday season, but FFA doesn't care. They didn't give any consideration to realtime activities like that. But that's our goal, is to have it back to you by then.

On the risk assessments, you get it the Monday of that week. The RI you get the Friday of that week.

On the OU-2 RI, that comes out in February of next year, and that's basing information on a good portion of the overall pilot study. We aren't running it all the way to the very end because we can get a good part of that understood and developed into the RI. It will take some of that into account. It's really not an RI issue. It's really an FS issue anyway, so it really doesn't have a major issue here. But we've also got some other analyses and things that are ongoing.

This is basically the same schedule as it was before for the RI. It's where we get to the FS, actually, that things start to lengthen out. And that's where we've got the pilot built in.

We've got the draft-final for the RI for OU-2 coming in June of next year, the draft-final of the FS for Operable Unit 1 and 3 coming out in September of next year. And again, that's to take into account the work that we're currently doing with the perchlorate pilot studies.

If you want, I'll try and point some of those out to you here. The perchlorate pilot studies are right here, this bar here. And the FS development is here. We've developed a good portion of this already as far as concept and so forth, but we need to get that final data off of the perchlorate study. We don't get that until about halfway through. That's why we have that schedule lengthened out.

Ultimately the RODs, once you get past the FS, all the proposed plan, public meeting and draft ROD, draft-final RODs, final RODs all follow the exact same time frames that we had established about two years ago, I think it was; two or three years ago. And the only changes that are occurring within

this schedule right now were ones that we implemented before this development, before this schedule came out, as well as the pilot studies that we've got going.

Basically, we come down to the RODs actually finalizing in the year 2000. That's not to say that the potential for interim remedial action doesn't exist, because I think it definitely does. There's a question of what do we do and how fast can we do it. That's what we're determining with the pilot scales.

ATWATER: Chuck, that's a good question. As you go forward in '99, one suggestion I would have is that you might want to begin discussions with the City of Pasadena for a pump and treat of the Arroyo well, because I know from their standpoint that would be very beneficial. You have an existing agreement there, and then the agreement for existing treatment, you know, and that -- I don't know what the winter is going to be like, but if we had a drought in the next couple of years, they would certainly be interested in maintaining their level of production.

BURIL: Sure. We have had an invitation from the City of Pasadena to come and talk with them.

And in fact, we are planning on doing just that. It's my understanding that we'll have some folks from Department of Water and Power, probably Rufus. I'm not sure who he'll bring in. I imagine he'll probably bring in Shaun and Brad, and possibly Elizabeth.

ATWATER: Elizabeth left.

BURIL: I didn't know that.

CARLOS: She's with us now.

ATWATER: Better watch your step. She works for the Regional Board now.

BURIL: I didn't know that. When did that happen?

ATWATER: Just recently.

CARLOS: A month ago.

BURIL: She went on personal leave for a while, I know.

ATWATER: She adopted.

BURIL: She adopted a baby, yes.

ATWATER: But then she just announced and went to work for them.

CARLOS: I know when I saw the announcement, her name rings a bell to me when I saw it.

BURIL: I didn't know that. Okay. Then Elizabeth won't be there.

But I would guess probably Shaun and Brad and probably Rufus would be there, and then whoever else they bring in.

ATWATER: Good.

BURIL: So yes, we definitely want to share a lot of the information we've got. We want to give them as much as we can to get the communication lines open and moving on this. Certainly they have a key potential role in this and I think it's important for them to understand what we would like to see happen if we come up with a way to utilize their wells or what they'd like to see from us in addition and just work it through that way.

ATWATER: On a related matter, you know, you had asked me and I talked to them about, they have not sampled since early last -- this year, excuse me, January, February, at the Arroyo well. I just think you might want to talk to them about figuring out a way to continue to sample at that well.

BURIL: That's an interesting question.

ATWATER: Just from a data point, that's the one area where we don't have any data. If you want to explore with them, I think they're open.

CUTLER: That's a hot spot.

ATWATER: They're not sampling because they

don't have the well on.

BURIL: They have nowhere to put the water even if they turned it on. That's not a bad idea. I'm just trying to think of a way that we can do that. Does that well have a sounding tube, do you know?

ATWATER: I don't know.

BURIL: If it had a two-inch sounding tube we could drop one of our pumps down and --

CUTLER: It does have a tube off the side, but there's a pretty good little bend that comes out at an angle like this.

BURIL: That won't work.

CUTLER: You can just kind of barely get one of the depth sounders down there.

ATWATER: So you don't know of any practical way of taking a sample?

CUTLER: No.

BURIL: If you kick the pump on you're going to generate 1,000 gallons a minute of water you can't use.

CUTLER: Yes, that's the problem.

BURIL: That's a good idea. I wasn't aware you had already investigated that. I probably was, but I just forgot.

CUTLER: This was years ago when we sampled

them. I just remember from that.

BURIL: Okay. Basically, the scheduled deliverables that you have here takes you through the draft-final FS for the entire project.

On this particular one up here, that gets us through about -- right about here, about halfway through it. And all of this are monitoring reports, proposed plans, public meetings, draft-final RODs, et cetera.

I'd be happy to give you guys a copy of this schedule, or if you're crazy enough to want this, I'd be more than happy to give that to you too.

RIPPERDA: Just maybe two dates. What are the proposed dates for the two RODs?

BURIL: For the draft.

RIPPERDA: Draft ROD.

BURIL: Draft. Okay.

Draft OU-1 and 3 ROD would come to you folks June 12th of 2000.

Draft ROD for OU-2 would come six months later, January of 2001.

ATWATER: If you're okay, I'll take either one. Probably the shorter one is better, for obvious reasons. I'll give it to Ron and I'll have him put

it in his boardroom just so people can -- you know, seeing the schedule with all the producings and things is a good idea just so they --

BURIL: That's fine.

ATWATER: They see all this level of activity and 30 plus reports in a 24-month period is pretty -- it's very impressive.

BURIL: It's a very, I'll say, ambitious schedule given the level of effort that's going to be required to get through all these things. Foster Wheeler has got more work than they know what to do with.

ROBLES: They're never going to see the light of day again.

BURIL: I'll share with you just anecdotally that I went through two plotters trying to get these things. We bought one last fiscal year and hooked it up to my computer and it crashed flat. And we had people coming out for weeks trying to fix it. It wouldn't come up. Finally got a new one just last week and it crashed flat too. But we figured out what was wrong with it and got it running. So these are literally hot off the press. I started this last night at 5:30 printing, and according to my computer, it finished at midnight.

More than happy to give you copies of it, but realize it's going to take a little while.

ATWATER: That's fine.

RIPPERDA: I have two comments about the schedule. Can we get that interim SVE report to somewhat coincide with February 4 RI? You had said the RI is going to have a little bit of the SVE pilot stuff in it, but it be won't be very up-to-date information. So it might just help us when we're looking at the OU-2 RI --

BURIL: To have that information available?

RIPPERDA: Right. So rather than try to put it at four and a half months from the start, try to like have it like come maybe within a week or two of the RI so it's still within our comment period.

BURIL: Is that reasonable?

ROBLES: B.G.?

RANDOLPH: No. In fact, the report for the soil vapor, SVE pilot test is a separate document.

RIPPERDA: Exactly.

BURIL: But what he's saying is we keep the RI schedule, but then rather than the four and a half months we would have Vitthal do it to correspond with that one so we basically get them within a week or two of each other.

ROBLES: Is that possible?

HOSANGADI: Yeah. That gives four and a half months.

BURIL: I was just going to say. That's really close to four and a half months --

RIPPERDA: I thought it was close, but rather than letting it -- I'd rather have the target date be something like the 10th of February so it's still -- rather than have it be the nebulous four and a half months.

BURIL: Can we do that?

HOSANGADI: Yes. That's not a problem.

BURIL: Done. 10th of February.

RIPPERDA: Okay. And one other thing was on that ARAR discussion, because we're going into the holidays, it may be tough to get everyone together.

BURIL: I know.

RIPPERDA: I would not let that impact the FS at all. If you fail to get the agencies all together and reach some kind of consensus meeting, just go ahead and put in your draft FS.

BURIL: We'll beat up on it afterwards.

RIPPERDA: Put whatever table --

ROBLES: Proposed. Proposed table.

RIPPERDA: Right. That's what always is in a

draft. So don't wait on a meeting with the agencies. Try to make it happen, but just put in your proposed draft and we can then comment on it.

BURIL: All right.

ROBLES: That's a fair way to do it. Then we have the follow-up meetings, too.

CUTLER: It probably will work out, but like you're pointing out, there's a lot of possibilities here.

ROBLES: I know.

CUTLER: If we know what an ARAR is, maybe it's impossible for us to use a spreading basin for some reason. I don't know. Some adjudication -- just not the capacity. We won't spend a lot of time dealing with the City, how much capacity, when can we use it.

RIPPERDA: Right. All I'm saying is try to put together your draft table now, try to get DHS and the Board and the basin to comment on it before the FS, but given that we're going into the holidays you may not be able to get everybody to give you input.

CUTLER: The normal sequence of events is to have those ARARs. But you're right. We will do the best we can.

ROBLES: So we make a proposal and give it to

them so that we can get something back before the ARARs. At least we have one thing.

BURIL: What I hear Mark saying is give it your best shot.

RIPPERDA: Right.

BURIL: Try to get consensus. If you can't get the consensus before the due date, just put it out the way it is and we can deal with it then in terms of getting comments back. And if there are things that we've missed or things that we've included that maybe shouldn't have been, or whatever the situation might be, we can deal with it at that point and go from there. That seems fair. I have no reason to balk at that. Make our lives interesting.

ROBLES: Make his life interesting.

BURIL: If his life is interesting, mine is even more interesting, believe me.

Any questions on this? I guess you probably want to take a look at it for a little while, but feel free to come up and take a look at that. Again, if you do have a wish to, we've got the detail that breaks down every one of these tasks and all of the subtasks.

Okay. Next on the schedule, then, is Lincoln Avenue. Pete, what do you want to say about

Lincoln Avenue?

ROBLES: Well, what I want to say and what I can say are two different things.

We made a proposal to Lincoln Avenue. What date was that? I think it was the --

BURIL: It was a week ago Tuesday, I think it was.

ROBLES: So I guess our version five or seven. I'm not sure.

BURIL: It's more than three and less than ten. It's somewhere in there.

ROBLES: And they now have it in their hands and they are reviewing it. We're hoping that they do go for it. But the normal sequence of events with Lincoln Avenue is they usually take about six months to review and then toss it around and then they'll come back and reissue us a new one on their terms. We are about $70,000 difference.

GEBERT: That's all?

BURIL: Actually, it's even better than that, much better than that. When you deal with the issues that at one time were accepted and then subsequently rejected by Lincoln in terms of categories of cost, if you keep the original agreements, we're only $6,000 apart.

ROBLES: What they're looking for is stuff that we cannot quantify, and they've been throwing out in the papers 2.6 million. And when it comes down to quantifying categories, the offer is 1.07. And we're only 6,000 from those kinds of categories.

They have some other issues that they want to deal with right now. So we have told them that we are very -- we want this agreement, we want to be able to provide what is said in the agreement. We believe that it's beneficial to both of us, and particularly for the public. But we can't read and gauge their motives.

I don't know. I don't know what their motives are. They weren't forthcoming with any discussion. They do talk to the papers, but they don't talk to us.

RIPPERDA: This is basically a cash-out offer? You're offering them X dollars?

ROBLES: Right.

BURIL: Let me try to explain.

RIPPERDA: Plus some kind of O and M?

BURIL: I have to preface the discussion here that the negotiations are under the attorney confidentiality type issue, so I don't want to say more than what I should. Basically, it is payment

for past costs and an agreement to pay for operations and maintenance costs in the future.

RIPPERDA: Okay.

ROBLES: So we're hoping that they do accept it, and then we can get going on that. That will be the two areas we believe we have impacted solely that will be taken care of, is wellhead treatment, and we're anxious to do that. But we're at a point right now, to be honest with you, that if we keep getting jerked around, I'm going to have to just say, "Well, guys, the offer is off the table, you got to do what you got to do, because we're tired of playing games with you." We should have had this agreement three years ago.

ATWATER: Does it just deal with VOCs, or does it deal with perchlorate?

BURIL: It is silent to the issue of perchlorate, but it is open to doing other things outside of this agreement.

ROBLES: We made it clear that when we do find any treatment system for perchlorate, that we would come back to Pasadena, and if we had an agreement with Lincoln Avenue, to Lincoln Avenue to renegotiate those items and, honestly, any new chemicals that come up. If it can be attributed and

it's an issue that we need to do, we've got to go back and sit down and negotiate.

ATWATER: That's reasonable.

BURIL: That's an incredible segue, Peter. When you're done, I want to step right into Other.

ROBLES: That's our biggest concern. You can't cover everything. But we believe it should be heard on a case-by-case basis. Particularly, how do you negotiate something that there is no treatment for? We're hoping that this pilot program works. I've made it clear to Bob Hayward on that, that once this is done, we would consider and come back to him and say, "Hey, we need to talk about this chemical now that we've got something to deal with."

BURIL: Speaking of new chemicals, here is one that I only found out about yesterday afternoon: Hexavalent chromium. Some facet of California State's environmental agencies has determined a new health goal for hexavalent chromium, one which apparently has not yet been promulgated but is coming down the pipe rapidly. The level which they are proposing is .2 parts per billion, with a B. We can't even analyze that low.

Now, the data that you have in the RI will tell you that we have hexavalent chromium here on

site at one well. It's Well 13, and it's at moderate levels. It's 1s and maybe as high as 10 at one point, I think.

CUTLER: Maybe at teens, low 20s.

ROBLES: Parts per billion.

CUTLER: Yes.

BURIL: Right. We know that to be hexavalent because we speciated for it. As of 5:00 o'clock last night, this throws a new wrinkle into anything we're going to do in terms of remediation. I personally don't have experience with removal of metals to that kind of level. And if we are talking about something, as Rich has indicated, that we would like to provide to drinking water purveyors, we have another new issue before us.

ATWATER: This is a DHS proposed level, or do you know what agency?

BURIL: I don't know.

CARLOS: California Office of Environmental Health Hazard Assessment. It's the scientific arm of Cal EPA.

BURIL: I have not dealt with them in the past.

ROBLES: So in the case of that low, if we say we have nondetect, that still doesn't mean we have met the --

BURIL: It's my understanding that laboratories are attempting to find a way to improve the current detection levels. If they're successful, fine. But water with a very small amount of particulate in it could have a pretty dramatic impact of what we would see, particularly if that particulate has chromium in it.

CUTLER: They're going to have to go to another method. We're pushing the colorimetric method, getting down to 5 PPB here. They're going to have to go to something else to get down to 1s and 2s.

BURIL: From the practical perspective, if you take the decimal point off there, you're in parts per trillion.

ROBLES: Now, the second question in my mind, this is the first I've heard of it, chrome industry. Where is the source coming from?

BURIL: Here at JPL the only thing that we can understand as a source is the cooling tower, which is right down the street from Well 13.

ROBLES: But it's not just our cooling tower. All the cooling towers around here.

RIPPERDA: But don't worry about other people's. It's like they've got to deal with their own stuff. You got to deal with --

ROBLES: What I'm delineating, Mark, is where do I know where mine is and where everybody else's is since chrome is so assiduous in the environment.

BURIL: We don't know. And I think from the perspective of what we need to do amongst our group here is we need to recognize that if we do, indeed, go to some form of on-site removal action, meaning pump and treat, that we may very easily encounter a chromium treatment issue. And that would be irrespective of what we do with the water, because I don't think that we would be in a position of being able to discharge chrome in excess of that level. So here is a new wrinkle.

ATWATER: Do a little homework first. That's a good question to ask at our workshop with Gary. I don't know what the chromium drinking standard is.

BURIL: There isn't one.

CUTLER: There isn't one for hex chrome.

CARLOS: There's one for total chrome.

ATWATER: Yeah. That's what I was thinking. There's total.

GEBERT: The total is quite high, though.

BURIL: But this is speciating it specifically for public health protection for hex chrome. I think that this is the missing piece of this total

chrome limit. It's always been out there. No one has really been able to break the two apart so they've always just kind of left it alone. I think this is now saying your total chrome could be this, which principally would be trivalent, but now you've got your .2 over here and that's all the more hexavalent you have. That's the way I would anticipate this ultimately falling out in terms of the regulatory scheme.

ATWATER: Are you using this as an adopted regulation?

BURIL: It's a proposed, is what I understand.

CUTLER: Right. There's no legal finding at this point. It's a recommendation.

BURIL: From the perspective of what we're doing here, we need to be very aware of it. It could easily become an ARAR down the road. If we get an FS done before something like this is promulgated, we could very easily be revisiting an FS at some point in the future as a result. Something to be aware of.

ATWATER: Yeah.

BURIL: If anyone has any idea how to treat to under .2 parts per billion for chrome, please speak up.

ROBLES: Cat tails.

CUTLER: We have an expert on hex chrome. Mark did his Ph.D. dissertation.

LOSI: I know a little bit about it. It's similar to perchlorate. It's an anion. It's bioreducible. It's mobile. It's less stable than perchlorate, probably. You know, the same types of treatments that apply to perchlorate would more or less apply to that. But when you're looking at a level like .2 PPB, bench scale studies.

BURIL: We'll report back on that as events warrant. But this is the chemical du jour, I guess, of concern.

RIPPERDA: It's going to concern so many people so much more than it concerns you that we'll worry about it when it --

BURIL: When it really makes an issue.

ATWATER: Be glad you only have it in one monitoring well. It's not a common background level.

BURIL: I'm hopeful it becomes a non-issue.

ATWATER: It's a lot bigger problem for a lot of other places in the state.

ROBLES: The political issues are incredible.

RIPPERDA: Moving out of the Cal EPA lab to an

actual promulgated standard --

BURIL: We'll worry about it then.

RIPPERDA: Yeah.

ATWATER: We'll get the perchlorate EPA standard adopted before this one. That's my prediction.

BURIL: I've got a bet with a friend of mine over at Lockheed. She says that the level will stay the same on perchlorate. I'm betting it goes down.

ATWATER: Really?

BURIL: That's just because I'm a pessimist.

Okay. Anything else under Other?

Did I cover what you fellows wanted to get out there? I know we talked ARARs. I know we talked about chromium. Did we get everything else?

HOSANGADI: Groundwater model.

CUTLER: Groundwater model.

BURIL: Thank you. That was the other one.

We're at the point right now where we need to use our groundwater model rather extensively to start understanding best options for the placement of wells and quantity of pumping and things of that nature.

Mark, at one time you had expressed an interest in getting together with our modeler and actually taking a look at the system itself and

understand how it's set up, I guess. I'm not sure exactly where your interests lie, but you did want to get together with him.

RIPPERDA: My interest at that time was really in my being here and the Raymond Basin wasn't involved in these meetings at all. What I was hearing from Ron Palmer then was kind of what's the conceptual remedial actions, what might be happening.

One of the things he kept saying is, or just kind of nobody knew what conceptual remedial actions were going to be, and so what were the impacts of your perchlorate plume on downgradient potential receptors. There's no known treatment, so what's going to happen at the Pasadena well or some other well that's impacted, can you draw water from somewhere else.

So it was more a question of that, of looking at conceptual remedial actions and what can you do to protect local water purveyors rather than trying to understand the nuts and bolts of your groundwater well.

BURIL: Well, that's basically where we're at now, is we do want to use it to do conceptual remedial action work.

Is there still a desire on your part to come out and take a look at it before we move into that, or are you satisfied with what you've seen thus far? You haven't seen much of anything, as far as I know.

RIPPERDA: Right. I've been seeing a couple statements in this RI about looking at long-term effects by, you know, assigning whatever the concentration is at MW-17 as a point source and using that to look at downgradient. I'll have to read that more carefully and think about it because that made a little bit of sense. But I guess I don't know. I'll have to think about this. Because to really go down and look at the groundwater model, to say, oooh, is this correct or is it a usable one or not, would mean days of looking at history matching and boundary conditions and initial conditions and geology. And I don't know. I have to talk to my consultant to do that.

BURIL: Let me encourage you to take a look through some of the stuff that you should have. I believe that we submitted the model choice report. Didn't we give that to the agencies? Do you remember? Remember when we went through the 15 models and selected one?

CUTLER: I don't know if that ever ended up with the agencies or not.

NIOU: You never gave it to us.

BURIL: If you would check it just to be sure.

CUTLER: I think that was back in '93.

BURIL: It was like in '92.

CUTLER: It was a long time ago.

BURIL: What we've used is Mod Flow.

ATWATER: For Mark's benefit, last winter, Elizabeth from Pasadena, Metropolitan staff and myself and my staff on behalf of the Raymond Basin Management Board, we did have a technical modeling group. The Metropolitan Water District is a part of doing a conjunctive use project for the City of Pasadena, Foothill Municipal Water District. And all the purveyors had developed a Mod Flow model more simplified, which, of course, it ran 100 by 100 foot cells, if I remember right, up here.

BURIL: We were down to 50 by 50 in some places.

ATWATER: Yes. It's a much coarser grid. We were using Mod Flow 2 for the whole basin. So we felt comfortable with what they're doing here at JPL with Mod Flow. And the only thing I would say is that it would be good that we probably get the modelers to talk to each other as we go forward over

this winter when you're evaluating these pump and treat options, and then we'd also want to overlay future assumptions about conjunctive use.

BURIL: Absolutely we'd want to have that built in.

ATWATER: We did that this summer when you wanted to use the baseline of pumping patterns. And I think we can set up a set of scenarios of pumping and treating with all the wells and the new wells that are going to be built under the conjunctive use project.

BURIL: We would very much like to have more information on all of that. That's critical to us.

ATWATER: I have a meeting next Tuesday with Metropolitan on that conjunctive use and the modeling work. So I don't know who you want me to work with, but we ought to just --

BURIL: You probably should come directly to me. We can draw on others from there.

ATWATER: Because I think we'll want to do that, have that modeling team where you reactivate it, make sure that the data sets and the assumptions --

BURIL: Rich, I don't know if you're aware, but at one time we offered to basically give all of our code and information to Met and to get our modeler

and their modelers together to basically fold our model into theirs to be able to get things going. I don't know if this is the same group.

ATWATER: Yeah, I remember those conversations. Yeah.

BURIL: Okay. We still stand ready to do that.

ATWATER: Perfect. I think that's a good strategy.

CUTLER: Just to put a clarification from our end, what you're talking about was more of a solute, fate and transport modeling which was not done with our three-dimensional groundwater model, which was put together to do just what Chuck was talking about, some remedial alternative scenario, simulations.

BURIL: Right. We do not have the solute transport portion of Mod Flow set up.

CUTLER: It was strictly a physical flow model to say, okay, if JPL wants to do hot spot reduction, what kind of GPM, where would you put it.

BURIL: What's the influence of the City of Pasadena wells when they're pumping together in this configuration or at this flow rate, and so on. What do things look like.

CUTLER: Exactly. Our comment was before we

start, Vitthal really gets into doing simulations and presenting some of this data, do the agencies want to get familiar with the model so when the time comes they can say, "Okay, I believe this. It's going to be realistic."

ROBLES: Would you guys want a debriefing?

RIPPERDA: Yeah.

CUTLER: Do you want to do that now or do you want to wait until you see -- when we get into the FS more? I think that's our basic question.

ROBLES: When do you guys want to have the whole dog-and-pony show of modeling and ask your questions so that when you see it in the document you can support it or have, potentially, questions.

BURIL: We do have that final calibration report, too. Right, Mark?

CUTLER: Yeah. There's the core reports.

BURIL: I have not shared those with the agencies because they have not been something that we needed to bring forward at that particular time. But we do have it available.

RIPPERDA: I'd want to have your guy come up here and give us a fairly detailed briefing sometime in like maybe late spring. Let's see. When is the draft FS?

BURIL: It's June.

RIPPERDA: No. The draft FS is May 25. So about the first of June. So maybe a month before that or sometime before that so we've had a chance to be exposed to it before we get the document.

BURIL: Okay.

RIPPERDA: But he's had a chance to actually do a lot of --

BURIL: Of the simulations and --

RIPPERDA: -- a lot of the fine tuning. Like if you're going to use this as a predictive thing, I assume the guy knows what he's doing, there are lots of people working on it. But it's like what kind of sensitivity studies has he done, how well has he calibrated it, how good are his history matches when he uses like five years of data and compares to six and then compares that to what the actual six-year data was, how does it do the mounding in the Arroyo.

BURIL: Right.

RIPPERDA: I'm not wild about groundwater models in a situation like this where you have intermittent mounding and wells going on and off and it's like you're trying to predict behavior 20 years into the future when you have no idea --

BURIL: What's going to be happening.

RIPPERDA: -- what's going to be happening --

ROBLES: 20 minutes from now.

RIPPERDA: -- in the Arroyo and with pumping. And so --

BURIL: This is where Rich and the Raymond Basin folks become so critical to all of our operations, our approaches, because we don't have good understandings as to what's realistic in terms of the operations and what's typical and what's absolutely ridiculous to consider, and so forth. And it's that kind of practical knowledge that we need to be able to factor into this very rapidly. The conjunctive use --

ATWATER: You made that presentation with the models, what was it, about a year ago?

BURIL: Yes, about that.

The conjunctive use issue is going to carry with it some major ramifications. In fact, do all the agencies here know what that is, conjunctive use program here? Yes? No?

GEBERT: Yes.

RIPPERDA: Maybe.

ATWATER: I'll give you a quick three-minute summary, I think.

In essence, today under the Raymond Basin

Judgment Metropolitan Water District has storage agreements to store about 25,000 acre-feet and the pumpers themselves have a judgment, have an ability to store their rights in the basin. There's another 25,000. So about 50,000 acre-feet of accrued credit, if you would, in the account. Of course, this wet year is an example, or the last five years, being a very wet hydrology, the amount of water in storage has gone up rather dramatically compared to the last 50 years of history since the adjudication.

The proposal is real simple, it is to increase the Metropolitan storage account from 25,000 acre-feet to 75,000 acre-feet, which would increase the total allowed storage, not that you'd go to the upper limit, of about 125,000 acre-feet. In the late 1980s C. H. Trumhill with the City of Pasadena and Metropolitan did an intensive Mod Flow modeling study of the basin and all of that, and we've looked at a storage possibility of 2- to 300,000 acre-feet. So it's well within the physical capability of the basin.

The basic concept is that in a wet year like this, in 1998, they would store imported water and to inject, they won't be injecting Colorado River anymore, not because of perchlorate but

because of TDS. Colorado River water runs 700 to about 750. Under the basin plan, the objective for the basin is for 50, so we'd want to inject State project water. And they built this new pipeline so you can inject State project water, but in with reduced groundwater pumping. In the wet years you'd store water. That's what we'd do in the wet years, like in 1998, we'd store extra water.

And then in a future drought or if we had the catastrophic San Andreas Fault and the imported water supply was out for three months, Pasadena, Lincoln, all of the agencies here would have, with these new wells, the ability to rely on 100 percent well water up to like two or three years during the next drought.

BURIL: You say new wells, Rich. Where and how many? Do you have any feel for that as far as --

ATWATER: Yeah.

BURIL: Are they like in Monk Hill subbasin?

ATWATER: Some in Monk Hill. Most of them are in the Pasadena basin. About five new Pasadena wells. Maybe a new well for Callahan and San Marino.

BURIL: How about up here in Monk Hill, Lincoln and Las Flores and all these guys?

ATWATER: You know, Valley and La Canada Irrigation would probably either rehab a couple of their existing wells or put in a couple more. And then with Lincoln, maybe one new well.

BURIL: Okay.

ATWATER: Las Flores --

BURIL: They only have one as it is, don't they?

ATWATER: Yeah. They're not a big enough system. So that's about it. It's like seven to eight new wells and we would inject more water than we do now. Pasadena is injecting this summer, which is something that you may not have known.

BURIL: No.

ATWATER: But they've been injecting this summer.

As a footnote, and this is something you need to know, is that last September, a year ago, we had a meeting with DHS and asked them about injecting Colorado River water at that time when we first did the first couple months of sampling on the order of 4 and 5. Both Metropolitan and DHS said it was fine at those background levels. And we keep them informed. At that time it was only Valley and La Canada that was injecting. In the future, though, it will be State project water. It's a $15

million pipeline from Glendale. So it would take water from the San Fernando Valley off the State aqueduct and inject it.

But that's conjunctive use and that's the strategy. So pump and treat is very compatible and there's an opportunity to, you know, both from a volatile standpoint and dealing with -- you know, right now what we know about perchlorate, pump and treat would be a very compatible strategy.

BURIL: Okay. Great.

ATWATER: So I'll follow up with you on the modeling so we can make sure that we got the right assumptions and all that, where the new wells are located so you're aware of it.

BURIL: Yes. We want to be very much involved in knowing what that is. Not so much in the decisions, but just knowing what's going on.

CUTLER: Rich, just a quick question on that. Do you know the timing on when that may actually be a reality of injection? Has there been any --

ATWATER: As far as the completion of the $15 million pipeline from Glendale over here, optimistically it would be about 24 months from now. More realistically, maybe three years. But Pasadena, like I said, they're constructing two new

wells. They're over in the -- I just blanked out. They're over to the eastern part of the -- what's the next arroyo to the east of us?

BURIL: Eaton Canyon?

ATWATER: Yeah. Eaton Canyon. They're over in that area. And that's where there -- there are two new wells. But those are under construction right now.

BURIL: That won't affect us, though.

ATWATER: No. No, it wouldn't.

BURIL: At least I hope not.

ATWATER: But they could construct their new facilities, obviously. Like these two wells, we could have all those probably in the next couple years.

BURIL: We'd like to definitely get involved with knowing where things are at so we can share the information we have with this area specifically.

ATWATER: As I've told you before, in discussions with Metropolitan, and I know the Raymond Basin Board and City of Pasadena, all of us, conceptually when you talk about this pump and treat here and expanding that a little bit, I think there's a -- if you will, this is the good news story. I think Metropolitan would be interested in

cost sharing with you to make that a little bit larger project. It may be cheaper to pump more here and treat it than to build a couple more wells somewhere else to get the same level of -- because the goal is City of Pasadena, Foothill, they want to have enough well production to meet their peak week in the hot summer months to droughtproof the area so that they don't have to have any imported water.

BURIL: I think we'd definitely like to be involved. So give me a call when you get everything together and we'll gather the appropriate players and come sit and listen.

ATWATER: Good.

BURIL: Did I get everybody on that side of the room's concerns? I forgot about the groundwater model.

RIPPERDA: Just to finish the groundwater model, maybe the next quarterly meeting, which would be in January, so it would be a little ways ahead of the FS coming out, have your modeler come up and talk for an hour or two.

BURIL: Why don't we plan on that, Mark.

CUTLER: The next RPM meeting you mean?

BURIL: Yes, the next RPM meeting. Have Perry come up and do his magic for us. He's done actually

quite a lot of work for CERCLA sites, hasn't he? RECQA sites.

CUTLER: He was doing some modeling for the Regional Board.

BURIL: He's very good. I think once you see what he's done I think you'll feel pretty good about it.

Okay. Anybody else have anything they want to throw on the table as far as other issues that we want to talk about? Okay.

RANDOLPH: Just one. I had an action item. I'm supposed to try to combine maps on soil vapor data. I attempted to do so. Hopefully this will satisfy you or be more like what you wanted to see. It's basically patterned after what we did for the groundwater work. Same type of format.

Is this more or less what you had in mind when you mentioned last time, Alex?

This is data that was presented to you at the last RPM meeting in the four major hits that we had on chemical compounds in the wells. It excludes the two or three hits that we had on 1,2-DCA and a couple of Freon 11s and things of that sort. This just basically covers carbon tet, Freon 113, TCE and 1,1-DCA. These are the last four sampling rounds

that we had, June and July of '97 and May and June of this year.

BURIL: Why don't Alex and Richard and Mark take a look at this, ruminate on it for a while, get back with us, if you have any comments with regard to how it's presented.

CARLOS: Okay.

BURIL: This is an effort in trying to present something three dimensional in a two-dimensional space.

RANDOLPH: Rather than like what Mark had mentioned last time, looking at a map over here and a table over here and trying to put the two of them together.

BURIL: Right. Hopefully this answers the bill.

RIPPERDA: The presentation looks -- this is what I had in mind.

BURIL: Take a look at it. If you have any comments, let us know, because this is going to be something that will come in the RI.

RANDOLPH: It will be very similar.

BURIL: Yes. So let us know as rapidly as you can so we can make any modifications before you actually get the draft.

CARLOS: Thank you.

BURIL: Great, B.G. Thank you.

Anything else?

RANDOLPH: I have one other question regarding risk assessment for OU-2 in which there is basically no guidance for soil vapor. I was hoping maybe our risk assessment people could get ahold of you, Richard, if they haven't already, as a focal point to help to guide them in the right direction and talk to the right people. I recall that even when we had Debbie Lowe, one of your previous predecessors, when she first got started, she had no idea and said that there wasn't any predecessor for trying to doing a risk assessment based on soil vapor well.

RIPPERDA: You look at vapor transport to the receptor, and open air there's no receptor or there's so much mixing so all you do is you look at what's the soil vapor being caught in a building, whatever the level is going to be in the building from soil vapor. So I don't -- if there's no pathway, there's no risk.

RANDOLPH: That's true. But I guess maybe our risk assessment people are not used to dealing with soil vapor and basically alone, and since we never did VOCs from the soil samples because results would

not be accepted by the Regional Water Quality Board, that was clear back with Michelle, and I can't remember the lady's name that preceded Jon Bishop.

BURIL: Oh, that was Gail Madyun.

RANDOLPH: Was it Gail?

CARLOS: Gail.

RANDOLPH: It was all decided at that point in time that no VOC data or analyses would be done on the soil samples.

RIPPERDA: So the only VOC data you have is this kind of stuff you just passed out, which is mostly deep boring.

RANDOLPH: Yes. It's all from initial probes in the 24 holes that we had, and now the 8 deep wells that go to groundwater.

RIPPERDA: So all the samples that you did around any of the cesspools that you evaluated, you don't have any either gas or soil for VOC?

RANDOLPH: We have some soil vapor data. We have 50 some-odd probes that we did all around the site. We have that data.

RIPPERDA: Okay.

RANDOLPH: And we've got the 24 soil vapor wells that some went to groundwater, some did not, during initial drilling back in '94. Then we have what

we've done here in '97 and '98.

RIPPERDA: So you do have some shallow soil vapor.

RANDOLPH: Yes.

RIPPERDA: From around buildings.

RANDOLPH: Right.

RIPPERDA: That's the data that you'd use. I'm sure your risk assessor must work on that. I know our risk assessor -- a lot of military bases don't look at that and our risk assessors always do want them to.

RANDOLPH: Right.

RIPPERDA: Dan Stralka in my office does some work on soil vapor transport into buildings. So if you want your risk assessor to talk directly to Dan --

RANDOLPH: Dan Stralka.

RIPPERDA: Yes. I can give you -- I can call you back with his phone number or give it to -- I guess I should technically give it to you so you can give it to him.

BURIL: I know Dan. You can give it to me and we can get B.G. and all those folks together. It's no problem.

CARLOS: Other folks have also converted the

soil vapor into soil concentration.

HOSANGADI: Using the formula that you have in the Water Board guidelines?

CARLOS: Yes.

RIPPERDA: But if the only pathway is -- if there's not a direct contact pathway -- so if the pathway you're worried about is indoor air, which is kind of the one that people worry about the most, then it's better to have the soil vapor data than the actual soil data.

BURIL: Yes. Does that help, B.G.?

RANDOLPH: Yes, it does. The only concern I have is that soil vapor data that we do have even for shallow for permeating into buildings is going through concrete and these buildings are all air conditioned and the volumes of air are probably exchanged eight to ten times a day.

RIPPERDA: That actually helps you.

RANDOLPH: Oh, yeah.

RIPPERDA: Because you can show there's a de minimis amount that's going into the building and you talk about air flushings per hour, whatever. Say there's no risk.

BURIL: What you actually identified was ways that pathways may not be completed and the

concentrations have been reduced to such a degree that even if a pathway did exist, it would be a low enough concentration not to be a problem.

RANDOLPH: Right.

BURIL: That's the kind of analysis we have to go through.

RANDOLPH: It would be way under the TTLs and NIOFS criteria.

BURIL: Okay. I'll get Dan's number from you, then. I don't think I have his number now.

RIPPERDA: I don't have it with me.

BURIL: Give me a call and let me know and we'll get everybody together.

I'm going to dance through the action items from last time and be sure that we've got everything covered.

We were going to get a draft letter regarding the discharge of perchlorate. That's all been taken care of. We have the letter. We've already done sampling. Everything is great, by the way. We found nothing. We're going to be doing sampling again several times throughout the perchlorate pilot. So I think we're in good shape as far as that discharge letter goes.

B.G. was going to make a map regarding the

soil vapor results. You have that in your hands. And if you have any comments, please get back to us as soon as you can because we would like to incorporate that comment up front in the draft.

I was to check the Edwards Air Force Base ARARs disk that Peter brought and mentioned at the last meeting. I have done that. Had it been something that was generally useful and not tied specifically to Edwards Air Force Base, it would have been extremely powerful. As it stands, it's very specific to the Mohave region for the Regional Board, to DTSC Region 5, I think it is, out there. I'm not sure what it is, but it's different than it is here. It is very specific to the constituents that were peculiar to Edwards Air Force Base. Carbon tetrachloride is not discussed, nor is perchlorate. So it really didn't appear to be that useful. It may be something that we could look to and maybe find some obscure things that may apply to both locations for whatever reason that are State requirements. But unfortunately, it's not something that's directly applicable. But we can utilize that as at least some form of a resource when we go to generate an ARAR table for you folks to review.

It says here that we'll review the

administrative record list and then send that to the RPMs for their attorneys to review. When you say -- does anyone remember this one, what you wanted? Because I haven't done it and I don't remember what it is.

CARLOS: I don't recall.

RIPPERDA: That sounds like something that might have come from one of my lawyers and I just passed along, but I don't remember it.

BURIL: Neither do I.

RIPPERDA: I frequently forget what the lawyers ask me to do.

BURIL: I try to do so with regularity.

RIPPERDA: So I could have asked you that and then since it meant nothing to me, I forgot it.

BURIL: If you remember, give me a call and I'll pull it together. I can't recall what this is just reading it right here.

We were going to continue to work together with Rich Atwater to obtain the groundwater data from Raymond Basin wells. We have some of that already, and depending upon how much we have, we may be coming back to you to try to get some more of historical stuff so we can include that in our RI and draft-final.

As far as what's coming up, we were also going to look at a matrix approach to deal with the response to comments. I think that was Stephen's suggestion at the last meeting. We'll be doing that. We'll see if we can pull that together. From what I recall, it was not an overly difficult thing to do, but we'll be trying to establish that for you.

The next meeting is supposedly going to happen in January, but first let's check. Judy, have you been keeping track of the action items that we've generated from this meeting?

NOVELLY: Yes. The action items from this meeting are that we will schedule a meeting to discuss the ARARs and prior to this NASA, JPL and Foster Wheeler will put together lists of the proposed ARARs for different remedial scenarios and we will send those lists to the agencies and Rich Atwater prior to the ARAR meeting.

We will provide a status report on the soil vapor extraction pilot at the midpoint of the pilot test. This will be due to the agencies on February 10th.

We'll coordinate with Alex to make sure that he can be here to observe the baseline soil

vapor sampling.

Gary Yamamoto has been added to our distribution list for a copy of the draft-final RI.

We are going to set up a detailed briefing by the groundwater modeler for the RPMs, and this will take place at the next RPM meeting.

Mark is going to give Dan Strolka's number to Chuck so that Foster Wheeler risk assessors can discuss methods for evaluating soil vapor.

Brian is going to check back to see specifically what information is required on the administrative record.

BURIL: Brian?

NOVELLY: Oh, I'm sorry. Mark.

RIPPERDA: I'm not going to check. I'm just going to wait for somebody to ask again.

BURIL: That's fine.

NOVELLY: Just let Brian do it.

BURIL: That's fine.

Next meeting. Theoretically in January to meet the quarterly schedule as required by the FFA. Do I hear suggestions for dates? I will tell you that JPL all but rolls up its sidewalks during the holiday season. Most people will be getting back, I think it's January 4th, which is the first Monday

after New Year's. So I would request that we focus away from that first week, as things are just going to be coming back up to speed here on the Laboratory.

You will be receiving the draft-final reports the following week. If you want to receive them directly when you come to the meeting we can manage that. I'm sure Mark would love flying back with an arm load of reports.

RIPPERDA: First I have a question before we talk about scheduling.

BURIL: Sure.

RIPPERDA: This is a scheduling question. What new is going to happen between now and then? Should we put the meeting off three weeks or a month so that we actually have the draft-final, we'd have a couple weeks to at least glance at it?

BURIL: I don't have a problem with that. That's actually a good idea.

ATWATER: It is.

RIPPERDA: It would be February so we'd have both the draft-final --

ATWATER: Give us a couple weeks at least to look at the report.

RIPPERDA: -- and a draft OU-2 RI. Or would

that be too much for one meeting?

BURIL: I think you're probably going to bite off more than you want to chew with both OU-1/3 responses and OU-2.

RIPPERDA: So let's schedule the meeting at a time when we've had a couple of weeks to look at the draft-final RI and we can have your modeler come in to talk about -- so it will be mostly a groundwater meeting, but it will be a few weeks after we get the draft-final.

BURIL: That would be, then, toward the end of February -- or excuse me, January. So something along the week of the 25th, I think would be the time frame we'd be looking at. That would be about two weeks after you get the risk assessment and RI.

RIPPERDA: So last week of January, first week of February would be kind of the target dates.

BURIL: Okay. Do you have calendars that go out that far, Judy?

NOVELLY: No, but I can get you some.

NIOU: 28th is a Thursday? 28th is Thursday.

BURIL: Is there a specific day of the week that works better or worse for people?

GEBERT: Not really.

RIPPERDA: Third Thursdays are fine.

BURIL: Thursday is fine for me. I have no problem with that at all.

ATWATER: Do you want to do January 28th, then?

BURIL: January 28th is fine. I don't think my calendar goes out that far at this point. So I'm sure I'm open that date.

Pete, you haven't got anything hanging in the wings that time frame, do you?

ROBLES: That sounds good to me.

BURIL: Location. I'm going to suggest that it be here, since our modeler will be coming in to give us a presentation. It will be a lot easier for him.

Is 10:00 A.M. still a good time? All right. 10:00 A.M. January 28th, here at JPL.

And I hope you all enjoy the wonderful bedtime reading we supplied to you. Look forward to seeing your comments here in a couple weeks.

CARLOS: Thank you.

BURIL: Thank you very much. We'll see you in January.

(The proceedings adjourned at 1:22 P.M.)

ENVIRONMENTAL AFFAIRS OFFICE
MEETING ATTENDANCE RECORD

SUPERFUND RPM MEETING

October 16, 1998

Please print the information requested below and pass this sheet along to the next person. Thank you.

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